

SCIEN

By A Group of Supervisors





The Main Book



AL TALADA BOOKSTONE

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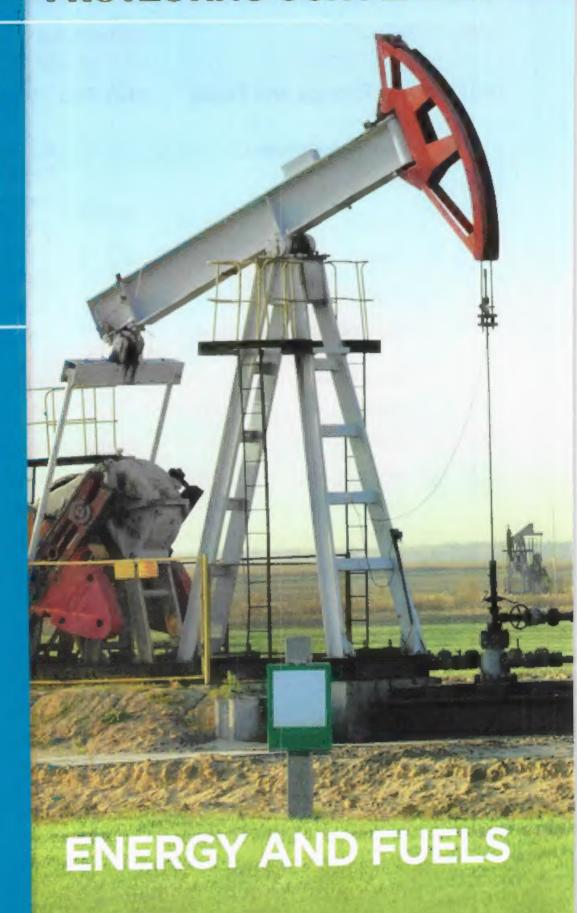
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THEME THREE: PROTECTING OUR PLANET

5 UNIT



Get Started

What I Already Know



- During the first term of this year, you have learned the meaning of energy and its relationship with work and movement.
 In this unit, we are going to learn more about energy and fuel.
- There are many forms of fuel that man uses in his daily life such as :









- Man uses the energy produced from burning fuel in many purposes such as cooking, warming, moving carsetc.
- Also, man uses the energy produced from burning fuel in generating electricity that is used in lighting lamps and operating devices.
- In this unit we are going to study :
- Forms and types of fuel.
- Renewable and non-renewable resources of energy.
- Different uses of solar energy as a renewable resource of energy.
- Using wind and water to generate electricity.
- How we can conserve energy.

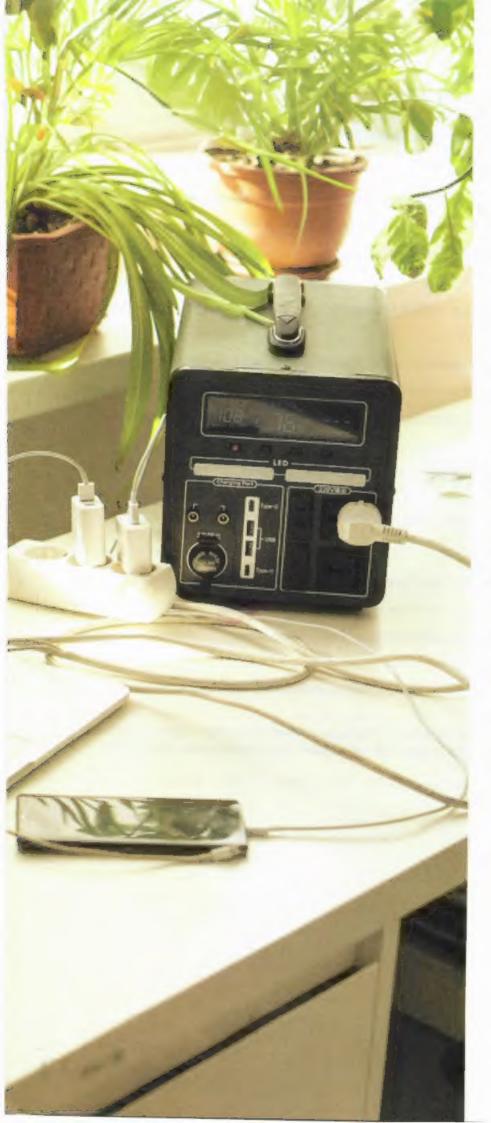
Unit Project : The Effect of Building Dams :

- At the end of this unit, you are going to do a research project about "Water" as one of the energy resources and how to use the kinetic energy of the flowing water of rivers to generate electrical energy by building dams on these rivers.
- You will also search for the effect of the constructing of these dams on the surrounding environment.



Water dam

Devices and Energy



Learning outcomes

By the end of this concept, your child will be able to:

- Develop models based on observations that describe how everyday devices transform energy.
- Use observations and evidence to explain how energy is transferred from place to place,

Key vocabulary

- Chemical energy
- Energy transfer
- Earth
- Energy source
- Sun
- Energy conservation

Notes For Parents On Concept [3.1]

Lessons	Activities	What you should do with your child
	Activity 1	Discuss with your child some devices that need electricity to be operated.
1	Activity 2	Discuss with your child the importance of batteries in operating some devices.
	Activity 3	Help your child read more about Mars rover Curiosity from some online sources
•	Activity 4	Let your child mention the input and output energies in some other devices.
2	Activity 5	Discuss with your child the meaning of energy chains.
0	Activity 6	Let your child mention the consumed energy and produced energy in some other devices.
3	Activity 7	Discuss with your child the energy transformation while riding a bike.
	Activity 8	Help your child track the path of energy in some devices.
4	Activity 9	Let your child form an energy chain to one of home electric devices.
	Activity 10	Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation.

LESSON ONE

Activity 1 Can You Explain?



- Most of the energy we use is produced inside the Sun.
- Energy can be changed from one form to another.
- The pictures above show some devices in which energy is converted.

What types of energy transformations are required for sunlight to operate devices?

- Most devices depend on electricity, and to generate electricity, we can convert the energy of the Sun in different ways.
- Different devices can convert the light energy that comes from the Sun into different forms of energy such as in solar powered calculator, the solar cells changes the energy of sunlight (solar energy) into electrical energy which is used to operate the calculator.

In this concept, we will study :

- Energy in toy cars that can be controlled remotely.
- Mars exploration rover.
- · Energy chains.
- Energy and devices that we use in everyday life.
- Conservation of energy.
- Tracking of energy path.

produce	
convert	
required	

Activity 2 Energy in Remote-Controlled Cars

▶ Look at the opposite pictures, then put (✓) or (✗):

- 1. The child in picture (1) uses a remote control to move the car.
- 2. The child in picture (2) can move the car remotely.
- 3. Both cars in the opposite pictures need electric energy to move.



Picture (1)



Picture (2)

Energy in remote-controlled cars:

- · Many toys such as cars, trucks, planes, boats and small robots may operate remotely.
- · However, all of these toys need energy to move and perform activities like spinning in the corners and moving forward or backward remotely.



▶ How do those toys get energy ?

Batteries inside the toys are the resource of chemical energy that is converted into electrical energy.

The electrical energy is converted into kinetic energy or sound energy to move the toys and make them perform their activities.

▶ But, what do we do when the batteries of these toys run out?

Batteries can be recharged by connecting the device to a nearby charger, or by replacing the old batteries with new ones.



Check your understanding

Complete the following sentences using the words below:

(kinetic - chemical - electrical)

- The energy stored in batteries is _____ energy.
- 2. In batteries of a remote-controlled toy, chemical energy is converted into energy, which is converted into _____energy or sound energy.

Activity 3 Mars Rover

- Have you ever seen a picture of an exploration rover on Mars ?
- This rover shown in the picture below needs energy to be operated, so it can explore Mars. Have you thought about how it gets the energy it requires to be operated?

Mars exploration rover:

- · Mars is about 54 million kilometers away from Earth, so the spacecraft will take about six months to go that distance.
- In the last few years, man has sent many missions to Mars. None of these missions included people, but they had vehicles or robots which are operated remotely.
- · The "Mars rover Curiosity" is one of the most well-known of these robots which travels on the surface of Mars.



Mars rover Curiosity

- These robots, like remote-controlled toys, require energy to be operated, but the batteries used in the toys cannot be used in Mars rover Curiosity as it is too distant from a store or charger plug or sockets on Earth.
- ▶ What is the resource of energy that Curiosity exploration rover needs to be operated?

The Curiosity exploration rover uses solar panels and batteries (which are charged by solar energy) as a resource of energy, where:

The solar panels on the rover convert solar energy into electrical energy, which is used to charge the rover's batteries.

The electrical energy from the batteries powers the vehicle's sensors and the electrical energy is also converted into kinetic energy and thermal energy as the vehicle moves across Mars surface.



Check your understanding

Complete the following sentences using the words below:

(kinetic - electrical - solar)

The solar panels on the Curiosity exploration rover convert ____ energy into ____ energy, which is converted into ____ and thermal energy.

In the Assessment Book: Try to answer: Self-Assessment (1)

Mars exploration distance

vehicles كوكب المريخ solar energy استكشاف missions طافة حرارية thermal energy مسافة / لعد

rover مركبات

spacecraft طاقة شمسية

plug منجول solar panels مركبة فضائبة

class sensors

قابس كهرباء ألواح شمسية أجهزة استشعار

Exercises on Lesson 1

O Higher Thinking Skills

O Apply

•	C	hoose the correct ans	wer:					
	1.	The on the rove is used to charge its to a solar panels – elect c. solar panels – sour	trical	solar energy into b batteries – electri d. batteries – sound	cal	gy whic (Alex, 2		
ó	2.	In the battery of a toy	*	s converted into elec c. light	trical end d. thern			
,	3.	andener a. kinetic – sound – s c kinetic – sound – th	rgies. olar	b kinetic – thermal d sound – thermal	– solar	to	7	
u	4.	The energy source in		a hattan	d. fuel.	(Suez 2	2023)	
			o. tires.	c. battery.				
31	5.	It takes several a seconds	for a spacecraft to minutes	travel from Earth to c days	Mars. d. moni	ths		
i	6	Curiosity rover is des	igned to explore b. Mars.	c. the Sun.	d. the n	noon.		
2	P	ut (✓) or (X) :						
_	1.	Energy cannot be tra	nsformed from one	form to another.		()	
		We can convert the s			ıy.	()	
	3	. A toy car can continu	ie moving even afte	r its battery runs out	(जेप्टल	2023) ()	
c	4	. Curiosity is a vehicle	that travels across	the surface of the pla	anet Mar	s. (()	ļ
0		. Mars is located a few				(()	1
		. Mars rover Curiosity				(())
E		orrect the underlined						
E	1	. The solar energy pro	duced from the mo	on can be converted		,	,	
		into different forms of				(0		1
	2	. Toy cars depend on	fuel as a source of	electrical energy.		(1
	3	. Curiosity is a robotic	vehicle that is desi	gned to explore the s	surface Jiza 2023)	()
		of moon		10	/	4		r

Write the scientific term of each of the following:		
1. The source of energy in some toys that stores chemical energy.	()
2. The energy produced from batteries.	()
3. A robotic vehicle designed to explore the surface of Mars.	()
Complete the following sentences :		
1. The energy can be from one form to another.		
Remote controlled toy car converts energy stored in its b into energy that is converted into energy which move the car	atteries is used to	
3 To operate an electric mixer we use energy.		
 4. When your cell phone is out of charge, you must recharge its to operate it again. 		
 Some calculators can change solar energy into energy by sunlight. 	y using the	
 6. On planet Mars, Curiosity robot is operated by using ene sunlight that is converted into energy used to recharge its 	rgy from s batteries.	
Give reasons for :	_	
1. A remote-controlled toy car needs a battery to move from one place.	e to another	
2. Some calculators use the sunlight to operate.		
 3. Mars rover Curiosity operates for a long period of time on Mars wit need to be recharged. 	hout any (Alex. 202)	3)
7 What happens if?		
1. Batteries of remote-controlled toy car run out.		
Solar calculators were exposed to the sunlight.		

LESSION TWO

Activity 4 What Do You Already Know About Devices and Energy

	Dut /	(/)	Or	CYY	in	front	of	the	fol	owing	questions	
-1	PUL 1		DJI.			11 OHK	-01	11116	191	O TT III SI	daeamone	- 4

- Television needs sound energy to be operated.
- 2. Electrical energy is needed to operate an electric fan.

How does energy change (transform)?

Device	Consumed energy (input energy)	Produced energy (output energy)
Hair dryer	Electrical energy.	Thermal energy and sound energy.
Soap dispenser (Detergent bottle)	Potential energy (stored in the spring of the soap dispenser).	Kinetic energy (the movement of the soap upward).
Washing machine	Electrical energy.	Kinetic energy and sound energy.

Note

When you rub your hands, you will feel warm because kinetic energy (consumed energy) is converted into thermal energy (produced energy).





▶ Put (√) or (x):

The consumed energy in the blender is sound energy.

blender طاقة مستهنكه

The produced energy in remote-controlled toy car is chemical energy.

nub وضع potential energy مجفف شعر rub تحول transform washing machine منافة produced energy منافة spring consumed energy Ego detergent dispenser خلاط

Activity 5 Energy Chain

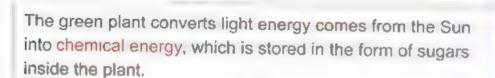
- You have learned that most of the energy we use is made inside the Sun.
- In this activity, we will discover how energy is transmitted from its resource to the devices we use

· Energy chains:

- Energy chain is a way to describe the energy flow that occurs when we use different devices.
- Energy chains often start with the Sun.
- Now, we will study some examples of energy chains

Energy chain when eating food:

The Sun emits light energy that reaches a plant such as an orange tree.



When you eat an orange, your body converts the chemical energy stored inside the fruit into kinetic energy when your body move.







The following diagram shows the energy chain in the previous example:

Light energy	Converted into	Chemical energy	Converted	Kinetic energy
(From the Sun)		(Stored inside the plant)		(Movement of the human body)

Energy chain when heating a pot of water over a fire:

Light energy comes from the Sun causes the growth of trees.



This light energy is converted into chemical energy which is stored in the form of sugars inside the trees.



When the wood of trees is burned, it releases thermal energy which heats the water inside the pot.



▶ The following diagram shows the energy chain in the previous example :

Light energy

Converted

Chemical energy

Converted

Thermal energy

(From the Sun)

(Stored inside the trees)

(When burning the wood of trees to heat the water inside the pot)

Give reasons for :

1. When you go for a walk, there is a change of energy takes place inside your body.

Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.

2. There is a change of energy when burning some wood of trees.

Because the chemical energy stored inside the wood of trees is converted into thermal energy.

Energy chain in a hair dryer:

Light energy from the Sun causes the growth of trees.



Coal is formed from the remains of dead trees that buried deep in the Earth over millions of years so, coal is a resource of energy that stores chemical energy.



Coal is used in electric power stations (power plant), because :

- 1. When coal is burned, it produces thermal energy.
- Then thermal energy is converted into kinetic energy which is used to operate certain devices in these stations in order to generate electrical energy.



Electrical energy goes through electric copper wires until it reaches the hair dryer to be operated producing thermal energy, kinetic energy and sound energy.



The following diagram shows the energy chain in the previous example:

Converted Thermal energy Chemical Light energy Converted into and kinetic energy into energy (In coal formed (From the Sun) from the remains (In electric power of dead trees) stations)

Converted

Thermal energy, kinetic energy and sound energy

Converted into

Electrical energy

(In the hair dryer)

(Goes through electric wires)

coal remains

had buried ble copper

electric power station = power plant

محظه فوي كهربية

₽ Notes

- 1. Not all the energy in an energy chain reaches the device.
- Some of the energy is wasted while travelling through the energy chain, as it is converted into other forms of energy. This is because energy is not destroyed but it is converted into other forms of energy that the device does not use.
- 3. Most of the wasted energy leaks out in the form of heat.



Check your understand

- ▶ Complete the following sentences using the words below: (heat — chemical — coal — kinetic — Sun — thermal)
 - 1. Most of the energy we use is produced inside the
 - 2. When you eat, your body turns the energy found in the food into energy that helps your body move.
 - In electric power stations, is burned to generate thermal energy.
 - 4. In an electric iron, electrical energy is converted into energy.
 - 5. In several electrical devices, most of the waste energy leaks out in the form of

In the Assessment Book : Try to answer : Self-Assessment 2

Exercises on Lesson 2

O Apply Higher Thinking Skills Understand Choose the correct answer: In the hair dryer, the electrical energy is converted into and energies. a. sound - thermal - kinetic b kinetic - light - chemical c thermal - light - chemical d light - sound - chemical 2. In the washing machine, the energy is converted into kinetic and sound energies. (Giza 2023) a. light b. electrical c. thermal d. potential 3. You feel warm when you rub your hands together, because energy is converted into thermal energy. (Cairo 2023) a. kinetic b. light c. electrical d. sound 4. Plants can convert the light energy from the Sun into energy which is stored in the plant in the form of sugar. a. sound b. electrical c. chemical d. kinetic. 5. When you eat an apple, your body converts the energy stored in the apple into energy when you move. a. chemical - electrical b. kinetic – chemical c. electrical - chemical d. chemical - kinetic 6. Electric wires are made of a. copper. b. paper. c. wood. d. glass. Put () or (x): In the soap dispenser, potential energy is converted into kinetic energy. 2. In the electric blender, sound energy is converted into electrical energy and kinetic energy. 3. Most of energy chains starts with the energy of the moon. G.ZA 2023 (4. Light energy from the Sun helps trees to grow. 5. Both the hair dryer and the washing machine depend on the same kind of energy to operate.

•	In electric power stations, sound energy produced from burning of coal is converted into electrical energy.		()
•	There is energy waste when energy is transformed from one form to another.	5	· · ·
•	Energy can be destroyed inside some devices.		()
3	Write the scientific term for each of the following:		
	1. The energy produced from a battery.	()
	2. The energy used to operate a television.	()
•	3. The main source of energy for most forms of energies on Earth.	()
4	4. The energy produced when the wood of trees is burned.	()
63	and the second s		
	that buried deep in the Earth over millions of years.	()
•	6. The energy stored in coal.	()
4	Complete the following sentences :		
•	 The energy produced from the battery and used to operate a toy ca energy. 	ris	
e.	When you press on the soap dispenser, energy stored in its soap upward energy that moves the soap upward.	pring is	
0	The energies that are produced from the washing machine are and energy.	energ	У
•	 When you rub your hands together, the energy is converted in energy. 	ito	
•	5. In any energy chain, some of the energy is wasted in the form of		
5	Give reasons for :		
•	1. There is an energy change when you press the spring of a soap dis	spenser.	
•	2. When you rub your hands together, you feel warm.		
	3. Not all the energy that enters the energy chain completely reaches	the dev	ice.
6	What happens to?		0455
0	The change of energy when you turn on the television.	(Cairo	2023)

- 2. The change of energy when you burn a piece of wood.
- Use the following words to complete the energy chains below.

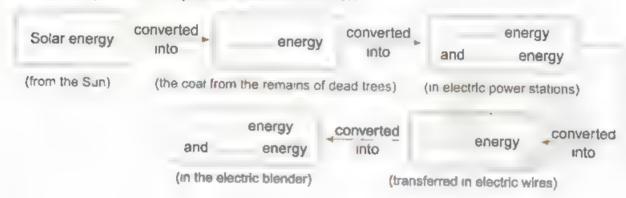
 (You may use the same word more than once).

(Thermal - Chemical - Kinetic - Electrical - Sound - Light)

1. The energy chain of burning some branches of a tree :



2. The energy chain to operate electric blender.



HESSON THREE

Activity 6 Energy and Everyday Devices

▶ Put (√) or (X):	Þ	Put	(V)	or	S	-
-------------------	---	-----	-----	----	---	---

- 1. In the guitar, sound energy is converted into kinetic energy.
- 2. The consumed energy in the blender is kinetic energy.
- The following table shows the function, the energy consumed and the energy produced in some devices:

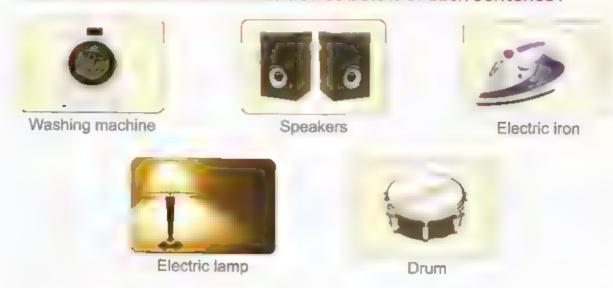
Device	Function	Consumed energy (input energy)	Produced energy (output energy)
	Lighting	Electrical energy	Light energy and thermal energy
Electric bulb			
9 3 3 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5	Showing the time	Chemical energy	Kinetic energy
Battery powered clock			
	Lighting	Chemical energy	Light energy and thermal energy
Flashlight			
To the second se	Alerting	Kinetic energy	Sound energy
Hand bell			
	Warming	Electrical energy	Thermal energy
Electric heater			

جرس يدوي



Check your understanding

▶ Write the name of the suitable device below of each sentence:



- 1. A device which converts electrical energy into sound energy only.
- 2. A device which converts electrical energy into light energy.
- 3. A device which converts kinetic energy into sound energy.
- 4. A device which converts electrical energy into kinetic energy.
- 5. A device which converts electrical energy into thermal energy only.

Activity 7 The Conservation of Energy

- Now, let's study some examples of energy transformation.

Energy chain while riding a bike:

When you eat, the chemical energy stored in the food provides your body with energy.



When you ride your bike and push the pedals, this chemical energy is converted into kinetic energy (mechanical energy), which causes the bike to move.



Some of the kinetic energy, is converted into thermal energy due to the tires friction with the road.



▶ The following diagram shows the energy chain of the previous example :

Chemical energy

Converted into

Kinetic energy

Converted into

Thermal energy

(In food)

(in the bike)

(Tire friction with the road)

Energy chain when a light bulb is switched on:

When you turn on a light bulb, the electrical energy that goes through the electrical wires is converted into light energy when it reaches the bulb.



If you put your hand near the light bulb, you can feel heat comes out of the light bulb because some of the electrical energy is also converted into thermal energy.



conservation of energy mechanical energy

tires حفظ الطاقة pedals یوفر wires طاقة ميكانيكية

road إطارات العجلة friction خواسات जधनी

احتكالت

▶ The following diagram shows the energy chain of the previous example :

Electrical energy

Converted Initio

Light energy and thermal energy

(In electrical wires)

(In the light bulb)

From the previous examples, we can conclude that :

Energy can be changed from one form into another, where the new energy cannot be created from nothing, and the old energy does not disappear but it changes from one form of energy into another, this is called "the law of conservation of energy"

The law of conservation of energy:

Energy can neither be created nor destroyed, but only converted from one form of energy into another.



▶ Put (√) or (x):

- When you ride a bike, some of the kinetic energy is converted into thermal energy due to the friction between tires and the road.
- Electrical energy is converted into light energy and sound energy when a light bulb is switched on.

In the Assessment Book: Try to answer: Self-Assessment (3)

Exercises on Lesson 3

		Understand	O Apreka	Higher Think	Ing Skills
		-			
1	C	hoose the correct a	nswer:		
	1.	can heat the cold w	ater inside it.	ergy is converted into	d chemical
		- P	b. thermal	c. electrical	
	2.	While playing a guit a, kinetic	ar, energy is one b. light	converted into sound c. chemical	d. potential
	3.	Inside a light bulb, e a. sound – light c. kinetic – light	electrical energy is c	onverted into b. sound – therma d. light – thermal	
	4.	When you turn on a reaching the bulb.	light bulb, the elect	rical energy travels t	hrough until
		a. wires	b. glass	c. wood	d. plastic
	5	. Both the hair dryer a chemical	and the electric wat b. thermal	er kettle produce c electrical	energy. d potential
ø	Some kinetic energy is converted into with the road.		energy due to f	riction of bike's tire	
		a. light	b. electrical	c. potential	d. thermal
	7.	Which form of energy	gy is not used or pro	duced when you turn	on an electric
		a. Electrical.	b. Light.	c. Thermal.	d. Sound.
	8.	. When you use the l	hand bell, the b. thermal	energy is converted c. kinetic	into sound energy d. electric
	9.	a. Chemical	electrical light.	er of energy changes b Chemical —— d Light —— cher	light — - electrical
	10	. If the energy a. sound	doesn't go through t b. electrical	he electric fan's wire c. kinetic	e, it will not turn on. d. thermal
2	P	'ut (✓) or (X):	hemical energy insid		,Cairo 2023) (

2. As a result of friction between bike's tires and the road, kinetic energy

is converted into chemical energy.

When pedalling a bike, the chemical energy in your l	oody		
is converted into kinetic energy.			(
4. Energy can't be changed from one form to another.			(
The electric bulb depends on chemical energy to open	erate.		(
Both the electric bulb and the electric heater produce	thermal ener	rgy.	(
Write the scientific term for each of the following :			
A form of energy produced from the electric lamp and	d affects		
our eyes.		(
2. Energy can neither be created nor destroyed, but onl	y converted		
	(Dakahlia 2023)	(
The energy produced from playing a guitar.	G / 2023,	(
4. The energy used to play a drum.	(Mnia 2023	(-
The energy that is used to operate an electric heater.		(
Complete the following sentences :			
1. When you ride a bicycle, energy stored in your energy which causes the bicycle to move.	food is conve	rted inte	o o
Some kinetic energy of the bicycle is converted into the friction of its tires with the road.	energy o	lue to	
 3. The electric lamp converts energy into light energy 	erov and	eneros	
The change of electrical energy into sound energy in that proves the law of	the radio is ai	energy examp	ole
5. Energy can neither be nor ., but only	from one for	m to	
another.			2023)
6. The electric lamp converts electrical energy into	energy and	_ en	ergy.
Give reasons for :			
1. You feel heat, when you put your hands near a lighted	l electric lamp).	
2. The presence of batteries inside a toy car.			
3 What happens if?			

1. You put your hands near the lighted lamp.

Mna 2043

UNIT CONCEPT 1

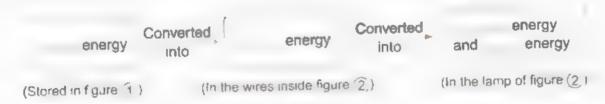
2. You shake a small bell with your hand. (according to the change of energy)

(Cairo 2023)

Look at the following figures then complete the following sentences:



- 1. Figure (1) stores energy.
- 2. Figure (2) needs a source that produces energy to be operated.
- 3. The energy chain that is produced due to inserting figure (1) inside figure (2) and turning it on is :



LESSON FOUR

Activity 8

- ▶ Look at the opposite picture, then put (✓) or (✗):
 - 1. All of the energy that enters the mobile phone (cell phone) is converted into light energy.
 - 2. Some of the energy in the mobile phone comes out as sound energy.



- According to the law of conservation of energy, all the energy that enters a device must finally come out of it, either in the same form or in other forms.
- All devices have energy coming in and out of them, where:
 - The energy that comes in a device is called "nput energy".
 - The energy that comes out a device is called output energy.
- · In this lesson, we will learn how the energy used to run a device is converted into other forms of energy, and where it flows.
- ▶ The table below shows examples of input energy and output energy in some devices:

Device	Its function	Input energy	Output energy
			Thermal energy (Heat produced from the hair dryer).
Hair dryer	Drying hair.	Electrical energy (In electric wires).	 Sound energy (Sound produced from the hair dryer),
			 Kinetic energy (Fan movement and airflow inside the hair dryer).
dobile phone	Ringing, illuminating, and	(When charging the mobile phone and this electrical	 Light energy (Light produced from the mobile phone). Sound energy
	processing information.	energy is stored inside the battery as chemical energy).	(Sound produced from the mobile phone).

The following diagrams show the energy flow chains of the previous examples:

Energy chain in the hair dryer

Electrical Converted and kinetic energy energies

(In electric wires) (In the hair dryer)

Energy chain in the mobile phone

Electrical energy	Converted into	Chemical energy	Converted into	Electrical energy	Converted	Sound and light energies
(Ahen chat . Eq. the probability)		Store to the mobile batter		To operate the		(Prod. ce from the mobile phone)

Notes

- 1. When we track the path of energy in any device, it looks like the device is losing energy, but the energy is actually being converted into another form, and some of the converted energy is not helping the device do its main function.
- Noise (sound energy) from a hair dryer is considered as "wasted energy" because sound energy does not help the device do its main function.
- 3. When using a mobile phone for a long time, some energy is wasted as ther male energy that does not help the device do its main functions.

- 13

Check your understanding

▶ Put (√) or (x):

- Some of the output energy does not help the device do the function for which it was designed.

 (
- 2. The input energy in the hair dryer is chemical energy.
- 3. The output thermal energy from a hair dryer is considered wasted energy because it does not help the device do its main function. ()
- The mobile phone stores electrical energy in its battery in the form of chemical energy.

Activity 9

- In the previous lessons, you have learned some examples of energy chains.
- Now, we will build an energy chain that shows the flow of energy starting with input energy and ending with output energy.

Light energy

Converted into



The Sun

Chemical energy

Converted into



Coal

Thermal energy and kinetic energy

Converted into



Electric power station (power plant)

Electrical energy

Converted into



Electric wires

Kinetic energy

(Energy which helps

Sound energy and thermal energy

Wasted joern is which do not help the blender do its job)



Biender



Check your understand

Complete the following energy chain in a television:

energy (from the Sun)

Converted into

energy (stored in coal)

Converted into

energy and energy (in electric power stations)

Converted into

energy (in electric wires)

Converted into

energy and energy

Energies which help the tale, sion - do is jub

..... energy

Westerd one-gy which does not need the television do its jub)

Activity 10

- ▶ In this concept, you have learned a lot about energy and how different devices get the energy that they need to be operated.
- In this activity which will be repeated at the end of each concept, we will learn how to think like scientists to answer a question about one of the main points of this concept through four main steps:

• Step (1): The Question.

• Step (2): My Claim.

• Step (3): My Evidence.

Step 4 : My Scientific Explanation.

? The Question

What forms of energy transformations must occur for sunlight to operate electrical devices?

My Claim

Forms of energy can be transformed into other forms of energy.

Note

Your claim should be formed of a sentence that gives an answer for the previous question in step (1).

My Evidence

- Almost all the energy we use comes from the Sun.
- Energy from the Sun can be converted into other forms of energy by technology.
- Electrical energy is necessary to operate the electrical devices.

You should mention enough and suitable evidence that support your claim.

My Scientific Explanation

- Almost all the energy we use originally comes from the Sun.
- The energy from the Sun is stored as chemical energy in sources like coal that can then be used to produce electricity at a power plant.
- Electrical devices can transform the electricity into other forms of energy, such as :
 - An electrical lamp transforms electrical energy into light and thermal energy.
 - The battery of a cell phone transforms electrical energy into chemical energy stored inside the battery that changes into electrical energy again to operate the cell phone.



Your scientific explanation should explain your claim and evidence introducing some supportive examples from what you have learned.

Review on Concept (3.1)

To review this concept look at the Assessment Book "Part 2: Final Revision".

in the Assessment Book

Try to answer

- Self-Assessment (4)
- Model Exam on Concept (3.1)

Exercises on Lesson 4

		● Understand	O Apply	Higher Thinking	g Skille		
Í.	C	hoose the correct ar	nswer:				
0	1.	The input energy wi	hen using the hair b. potential	dryer is the energy	gy. Cairo 2023 d. thermal		
	2.	Which form of energy. a. Kinetic energy. c. Thermal energy.	gy is not an output	t energy when a hair dry b. Electrical energy. d. Sound energy.			
	3.	During charging a nenergy that is stored a. electrical – chemic. electrical – therm	d in the phone bat ical	energy is converted tery. b. chemical – therm d. thermal – chemical	al		
o	4.	phone.		energies when operation			
D	5.	a. electrical The output energy va. chemical	b. potential when playing drum b. light	c. chemical ns is the energy. c. sound	d. light (Mma 2023) d. potential	j	
	6.	The produced a. chemical	energy does not b. sound	help the blender do its j	*		
U	7.	When a piece of co a. thermal	al is burned, b. solar	energy is produced. c. sound	d. potential		
	8.	 When a football player runs, the chen into and energies. a. potential – light c. thermal – kinetic 		nical energy inside his body is converted b. kinetic – light d. thermal – light			
	P	ut (🗸) or (x) :					
		Energy may be destroyed inside different devices. Carro 2023) () Some of the converted energy does not help some devices do the function for which it was designed.					
D	3.		-	hair dryer to do its fund	ction.		
2	4.	The input energy in	a hair dryer is the	chemical energy.	())	
		The energy chain of a		energy into and	ermal energy I light energy ()		
20	6.	In waterfalls, the wa	ter that falls down	has kinetic energy	/ \		

M (Vrite the scientific term of each of the following :		
1	The energy that is stored in both batteries and food.	(.)
- 2	The energy that is produced from the electric power stations and flows through wires.	(_)
3.	. A form of energy that is produced from the electric heater		
	and burning coal. (Alex. 2023)	()
- 4.	The energy that is produced from the blender and helps it do its job.	()
5.	The wasted energy when using a mobile phone for a long time.	()
Ic	omplete the following sentences :		
	The mobile phone converts chemical energy stored in its battery into	o electrica gy which a	
2.	By using the mobile phone for a long time, some energy is lost in theenergy.	e form of	
3.	The input energy of a hair dryer is energy, while the output of a hair dryer are energy, energy and	ut energies energy.	
4.	The wasted energies that are produced from a vacuum cleaner are energy and energy.		
5.	The main function of a blender is done by the help of the produced		
	energy.	(Alex. 20)	23)
6.	The input energy in an electric bulb is energy, while its out energies are energy and also energy which do in its main function.		
7.	The input energy when recharging a mobile phone is energy inside the phone battery.	ergy which	is
8	In the electric heater, energy is considered as an input er thermal energy is considered as energy.	nergy, whil	е
9	. The kinetic energy in a hand bell is considered as energy electric fan is considered as energy.	y, while in a	an

Give reasons for:

Thermal energy in a mobile phone is considered as a wasted energy.

- The electrical energy that enters the hair dryer does not come out of the hair dryer in the same form of energy.
- Sound energy and thermal energy are considered as wasted energy in the blender.

What happens if ...?

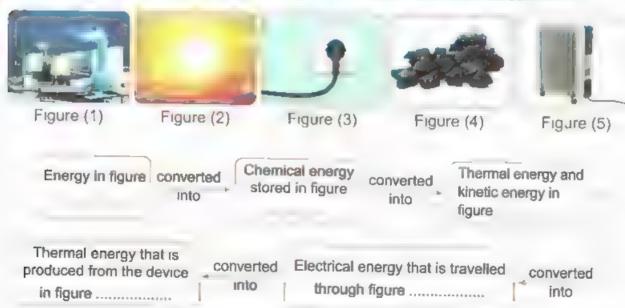
1. You use a mobile phone for a long time. (acco

(according to the wasted energy).

2. You turn on an electric fan.

(according to the change of energy).

Look at the following figures, then complete the following energy chain:



		on concept	10.11	-
(A) Choose the c	orrect answer :			(5 marks
1. The energy so	urce in a toy car is the .	4		
a. engine.	b. tires.	c. battery.	d. fuel.	
2. When you use	the hand bell, the	energy is converte	d into sound en	ergy.
a. light	b. thermal	c. kinetic	d. electric	
	g a mobile phone, the	energy is cor	verted into	+
energy that is a electrical –	stored in the phone bati chemical	tery. b. chemical – th	nermal	
c. electrical –		d. thermal - che	emical	
Some kinetic e with the road.	nergy is converted into	energy due	to friction of bike	e's tire
a. light	b. electrical	c. potential	d. thermal	
(B) What happen	s if solar calculators we	ere exposed to the	sunlight?	

(A) Put (✓) or (X):	(5 marks)
Energy can't be changed from one form to another.	()
2. The produced sound energy helps the hair dryer to do its function.	()
3. Curiosity is a vehicle that travels across the surface of the planet Mars.	()
4. In the soap dispenser, potential energy is converted into kinetic energy.	()
(B) Look at the following figures, then complete the following sentences	:



Figure (1)



Figure (2)

- 1. Figure (1) converts energy into energy.
- 2. Figure (2) converts . . energy into . energy and energy.

3. The energy chain that is produced due to inserting figure (1) inside figure (2) and turning it on is :

energy	converted	energy	converted	andenergy
(stored in figure 1)	(in	the wires inside figure	(2)	(in the lamp of figure (2))

of the following:	Saurks
S.	()
	()
the electric power stations	and flows through
and of trans in human	()
	s.

(B) Look at the following figures, then put (\checkmark) or (x):



Car (1)
Mars rover Curiosity



Car (2) Toy car

1.	The movement of the two cars can be controlled from a distance by using		
	a remote control.	(7
2.	Car (2) uses sunlight to move.	(7
3.	The two cars can convert the chemical energy stored in their batteries		
	into electrical energy.	()
4.	We can use an electric cable to recharge the battery that is placed in		
	car (1) again if it runs out.	(1

Model Exam on Concept (3.1)



(A) Choose the co	rrect answer:		-	te sh s
In the washing energies.	machine, the	energy is converted i	nto kinetic and sou	ind
a. light	b. electrical	c. thermal	d. potential	
You feel warm v converted into ti		hands together, becau	se energy is	
a. kinetic	b. light	c. electrical	d. sound	
a. sound – lightc. kinetic – light		y is converted into b. sound – ther d. light – therma	mal al	gies.
 When you turn reaching the bu 	_	e electrical energy tra		until
a. wires	b. glass	c. wood	d. plastic	
(A) Correct the un	derlined words :		49	17-16-5
1. Mars rover Curi	osity is designed to	explore Earth planet.	(.)
2. Most of energy	chains start with th	e moon.	()
3. There is a store	d thermal energy in	nside the food we eat.	(.)
4. The input energ	y in a hair dryer is	the chemical energy.	()
(B) Give a reason	for the following:			
Thermal energ	y in a mobile phone	e is considered as a w	asted energy.	
(A) Write the scie	ntific term of each	of the following:		racks,
1. The energy that	is used to operate	a television.	()
2. Energy can neit		destroyed, but only o	onverted)

		A LAND	COLUMN TO A STATE OF THE PARTY
1 14- 17	14 1 1 2	C BILL 1	ENLESS
DILY	IUE-U	MINID.	ENERGY

A kind of energy that is produced from the electric heater		
and burning coal.	()
4. The energy produced from playing guitar.	(1

(B) Choose from column (A) what suits it in both columns (B) and (C):

(A) Energy used	(B) The item	(C) Energy produced
1. Kinetic energy	a.	A. Thermal energy.
2. Electrical energy	b.	B. Chemical energy.
3. Solar energy	с.	C. Sound energy.

1. 2 . 3.

3.2 About Fuels





Learning outcomes

By the end of this concept, your child will be able to:

- Describe the ways in how different types of fossil fuels are formed and predict the properties and uses of different types of fossil fuels.
- Describe how the use of energy and fuels affects the environment.

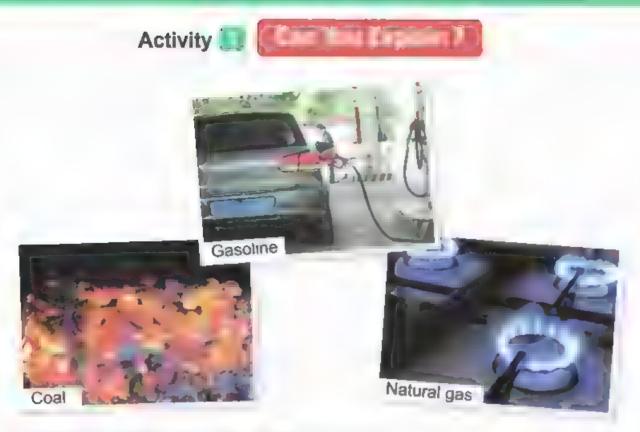
Key vocabulary

- Energy efficiency
- Nonrenewable energy resources
- Fossil fuels
- Renewable energy resources
- Fuels
- Generate energy
- Pollution

Heliza For Farenta un concent 12

Lessons	Activities	What you should do with your child
	Activity 1	Discuss with your child that any fuel must produce thermal energy when it is burned
1	Activity 2	Discuss with your child the importance of fuel in providing different means of transportation with energy to move
	Activity 3	Let your child mention some other uses of fuels in our daily life
	Activity 4	Discuss with your child the meaning of biofuels and fossil fuels.
2	Activity 5	Discuss with your child the formation of oil and how we can conserve oil and water
	Activity 6	Let your child arrange the steps of fossil fuel formation
3	Activity 7	Discuss with your child how to conserve the using of electricity
	Activity 8	Discuss with your child how fossit fuel is used to produce electricity.
	Activity 9	Discuss with your child the causes of pollution and their effects on human's health.
4	Activity 10	Discuss with your child the harms of burning fossil fuels on the environment
	Activity 11	Discuss with your child some ways to conserve fossil fuels.
	Activity 12	Let your child classify renewable energy resources and nonrenewable energy resources.
5	Activity 13	Help your child to think like a scientist by answering a question about one of the main points of this concept, then write his/her claim, evidence and scientific explanation.

LESSON DNE



- In the previous concept, you have learned about energy chains and that the Sun is the main source of energy.
- Fuel is one of the most important resources of energy that humans depend on to get energy.

Fuel:

It is any substance that produces thermal energy when it is burned.

- · We use fuels in many purposes such as :
 - Warming our houses.
 - Supply cars with energy to move.

▶ Where does the fuel we use every day come from ?

- The pictures above show several forms of fuels such as gasoline, coal and natural
 gas that we use in our daily lives, for example:
 Gasoline from the gas stations comes from oil which is extracted from the
 underground.
- In this concept, we will study:
 - Types of fuel.
 - Fossil fuel formation.
 - · Conserving fossil fuels.
- Oil and water.
- Using fossil fuels to generate electricity.

purposes coal

إزن القحم

conserve البنانان

Activity

- ▶ Look at the opposite picture, then put (*) or (*):
 - 1. Cars can move on roads when they run out of fuel.
 - Cars need fuel to get energy to move.



- Think about a trip with your family using a car. Read this story to learn why fuel is so important on road trips.
 - One morning, Hany's family woke up and decided to travel to Alexandria to visit aunt Nora, who lives there. Hany, his mother and sister Samar got into the car.
 - While driving down the highway, Samar noticed that the gasoline pointer was close to zero and she said to her mother that the fuel was running out and she needed to stop at the nearest gas station.
 - · Hany's mother drove to the nearest gas station, where a station worker filled the tank and then she drove the car again.
 - Hany asked his mother, "Why does a car need fuel to move?" She said the car needs fuel to move because the fuel is burned inside the car engine, allowing the engine to rotate the wheels, so without fuel, the car will not move.







▶ From the previous story, we can observe that :

Fuel is important to move cars, where the fuel is burned inside the car engine producing thermal energy that is converted into kinetic energy which causes the car to move.



Check your understanding

▶ Put (√) or (×):

- Cars need a source of energy to move.
- 2. The fuel is burned inside the car engine, allowing the engine to rotate the wheels. (

Activity (1) (Manufacture of the Control of the Con

In this activity, we will learn more about different forms of fuel and their uses.

Uses of some different forms of fuel:

Fuel is used for several purposes, such as :

Coal and wood

They are used in:



Warming

Gasoline and natural gas

They are used in:

Generating electricity

Operating all means of transportation





Natural gas also can be used in cooking food.



► The following energy chain shows how fuels such as coal can be used to get thermal energy :

Light energy

Converted

Chemical energy

Converted

Thermal energy

(From the Sun)

(Stored inside coal)

(When burning the coal)



Complete the following sentences using these words:

(thermal - gasoline - natural gas)

- 1. Fuel is used as a source of ____ energy.
- 2. Burning of _____ or ___ allows cars to move.

In the Assessment Book
Try to answer
Self-Assessment (5)

Exercises on Lesson 1

Understand

O Apply

Migher Thinking Skills

Choose the correct answer:

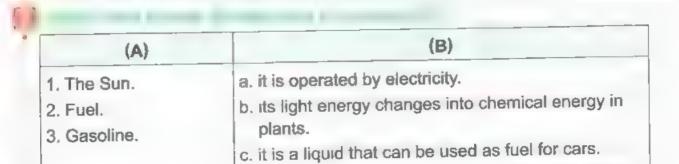
- 1. Among the forms of fuel that are present in car fuel stations are
 - a gasoline and wood.
 - b natural gas and coal.
 - c wood and coal.
 - d. gasoline and natural gas.
- When the speed of a moving car decreases gradually until it stops, this may happen due to all the following situations, except
 - a gasoline is completely run out.
 - b the car engine is damaged.
 - c the driver presses the brakes pedal.
 - d the driver presses the gasoline pedal.
- 3. The opposite figure represents the fuel indicator of a car, which referes to that the fuel tank
 - a is completely empty from gasoline.
 - b is completely full of gasoline.
 - c. has half amount of gasoline.
 - d has half amount of water.
- We can use the energy obtained from burning of wood directly for all of the following purposes, except
 - warming houses.

b operating television.

c cooking food.

d boiling water.

d. it is any substance that produces thermal energy



when it is burned.

1. 2. 3.





Put (✓) or (X):		
1 As the speed of a car increases, the amount of used fuel decreases.	()
2. We must check the amount of gasoline in the fuel tank before making		
a trip by a car.	()
Both coal and wood produce energy when they are burned.	()
 Natural gas is a form of fuels that can be used in generating electrical energy. 	()
5. When gasoline burned in the car engine, kinetic energy will be produced		
to move the car.	()
Correct the underlined words:		
We need sound energy, for cooking food and warming houses. ()
2. Coal is the main source of most energies on the Earth's surface. ()
3. Fuel is the substance that produces electrical energy on burning. (.)
Aisx	202	3
1. It is the main source of most forms of energy on the Earth's surface.		
(**)
The form of energy that is produced as a result of burning wood and coal.		
3 It is any substance which produces the second)
3. It is any substance which produces thermal energy on burning.		
)
Complete the following sentences:		
Gasoline is burned inside a car engine to produce energy that is converted into energy which causes the movement of the car.		
Some forms of fuel can be used in cooking such as and		
3. We can use some forms of fuel in warming houses such as and		
Give reasons for :		
1. The fuel is very important for different means of transportation.		
thousand or transportation,		
Sometimes the fuel indicator of a car goes down.		

- 9 3. Gasoline is burned inside a car engine.
- 8 What happens to ...?
 - 1. The car fuel indicator if the amount of gasoline in a car decreases.
 - 2. The car movement if fuel runs out in a car.
- 9
 - 1. Coal is a form of fuel, which is used in all the following purposes, except
 - a. cooking food.
 - b. operating cars.
 - c generating electricity.
 - d warming houses.
 - 2. Coal is burned to produce
 - a thermal energy.
 - c. natural gas.

- b. sound energy.
- d, wood of trees.
- 3. Coal and are used in warming houses.
 - a water

b plastic

c sand

d. wood



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LESSON TWO

Activity [1]

▶ Choose the correct answer from those between brackets :

1. From the fuels that are used in cooking food is

(oil - natural gas)

2. From the fuels that are used in generating electricity is

(coal - wood)

In the previous lesson, you have learned that fuels are substances that, when burned, they release thermal energy.

Types of fuel:

Types of fuel can be classified into:

Biofuels

Fossil fuels

1. Biofuels

Biofuels 1

They are fuels made from living organisms that can be planted (i.e., plants).

Examples:



- Wood is the oldest fuel that is still used all around the world



- Charcoal is made from wood and it is an important fuel.



- Some types of plants such as grass, corn and wood chips can be used to make a liquid fuel.
- Biofuels are renewable fuels which means that they can be continually renewed as plants grow.
- Although biofuels are renewable energy resources, they should be conserved, where:

Using wood as fuel requires cutting down trees.



Cutting down trees at a faster rate than they can grow leads to "deforestation, is which has negative effects on the environment.

Therefore, we should conserve using wood, so that it will not run out.

Note

Many trees grow a few centimeters each year, while some trees reach their full height in a period nearly equals the human's lifetime. This means that the growth of these trees takes more than one human's lifetime to complete their growth.

biofuels drass wood chips liquid fuel الدقود اتحبوي require item. infetime) رفيق حسب

charcoal وفود سائل Sum com renewable عمر الإسس

continually العجم سياني deforestation المره negative متحدد

إزاله الحابات

2. Fossil fuels

Fossil fuels:

They are fuels formed from the remains of plants and animals that were buried and decomposed over a long period of time.

Examples:



 Oil and natural gas were formed from the decomposition of the remains of ancient sea animals.



 Coal was formed from the decomposition of the remains of ancient plants.



Gasoline is a fuel made from oil.

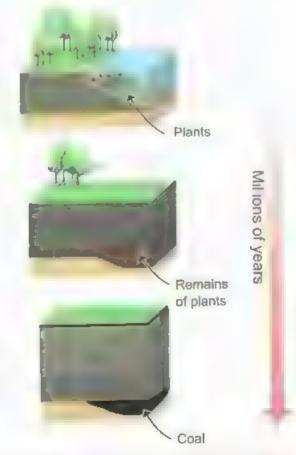
 Fossil fuels are nonrenewable fuels which means that they are gone and cannot be easily renewed.

Formation of coal:

Millions of years ago, large areas of the Earth were covered in swamps, with a lot of plants growing nearby.

When those plants died, their remains were decomposed and covered by hundreds of meters of mud and rocks.

Due to the effect of the Earth's heat and pressure, those remains were turned into coal.



Fossil fuels (coal, oil and natural gas) take millions of years to be formed, so they
are used faster than they are formed.

₽ Note

The original source of energy in biofuels and fossil fuels is the light energy of the Sun (solar energy)



Check your understanding

Complete the following table using the words below:

(living organisms — grass — renewable — oil — corn — nonrenewable — gasoline — millions of years)

Points of comparison	Biofuel	Fossil fuel
Definition :	Fuel made from that can be planted.	Fuel made from the remains of living organisms, that takes to be formed under certain conditions.
Renewable or nonrenewable :		
Examples :	Wood, and	Natural gas, coal, and



Oil and water are two types of resources that humans can use to generate energy.

Formation of oil:

Oil comes from deep in the ground, where oil formed from the decomposition of sea creatures, as follows:

When the sea creatures died, their remains settled on the sea floor.

Over millions of years, layers of sediments and rocks covered the remains of those sea creatures. These layers pressed down causing extreme heat and pressure.

Over time, as a result of extreme heat and pressure, those remains converted into oil.

The following table shows some differences between oil and water and how to conserve each of them:

> Water Oil

Oil is a nonrenewable energy resource.
 Water is a renewable energy resource.

It is a natural material that is used faster than it can be replaced.

· Conservation of oil:

Oil is used at a rate faster than the formation of new oil, so it should be conserved by many ways such as :

- Reducing the use of private vehicles.
- Using of public means of transportation.

It is a natural material that can be replaced soon after it is used.

· Conservation of water:

Water may not be replaced as quickly as we need it, so people should use water carefully to conserve it by many ways such as:

- Avoid wasting or polluting water.
- Growing plants that do not need large amounts of water for irrigation.

In the Assessment Book: Try to answer: Self-Assessment (6)

Exercises on Lesson 2

 Understand O Apply Higher Thinking Skills Choose the correct answer: 1. All the following are forms of fuel, except .. a. wood. b. natural gas. c. gasoline. d. glass. is considered as the main resource of energy on the Earth's surface. Gasoline The Sun Natural gas The moon Синупилия 2023 3. All the following are renewable resources of energy, except a. natural gas. b. water. c. the Sun. d_wind_ 4. Nonrenewable resources of energy take . . to be formed. a short period of time a very long period of time c. few minutes d few hours 5. Ancient people used as a fuel before discovering gasoline. a. electricity b. water c. wind d. wood 6. Wood is considered as (Alex 2023) biofuel. fossil fuel. liquid fuel. gaseous fuel. 7. Coal was formed under the Earth's surface from the remains of a. dead animals. b. dead plants. c. dead humans. d. dead insects. 8. Extreme heat and pressure under the Earth's surface has an important role in forming (Giza 2023) a. wood. b. wind. c. fossil fuel. d biofuel. (A) (B) 1. Water. a, it needs extreme heat and pressure to be formed from 2. Wind energy. remains of dead plants. b. it is the main resource of energy on the Earth's surface. 3. Coal. c. it is a gaseous renewable resource of energy. d. it is a liquid renewable resource of energy. 3. .. Put (V) or (X): 1. Biofuel is one of nonrenewable resources of energy. 2. Extreme cooling under the Earth's surface helps in the formation of oil.

	3. Water and gasoline are two renewable resources of energy.		()
	4. We have to reduce the usage of the Sun as a source of energy.		()
	5. The rate of usage of oil is slower than its rate of formation under			
	the Earth's surface.		()
	6 The Sun is the main source of forming both biofuel and fossil fuel.		()
	7. We can make a liquid fuel from grass and wood chips.		()
4	Correct the underlined words:			
	1. We have to increase planting vegetables and fruits that need			
	a large amount of water.	(.)
	2. In houses, gasoline is used in cooking food as it is one of the oldest			
		(}
	3. The nonrenewable resources of energy take a short period of time			
	to be formed under the Earth's surface.	()
	4. The moon is the main source of both biofuel and fossil fuel.			
		(****)
	5. We can use some animals to make a liquid biofuel.	()
	6. The rate of usage of fossil fuels must be increased.	()
	7. Wood is a form of fossil fuels that can be used in houses.	(_)
	8. Water is a nonrenewable resource of energy that can be used			
	as a fuel in cooking food and moving cars.	(_)
	9. We can conserve oil by increasing the use of private vehicles	()
1	The state of the s			
Cy-	1. Natural resources of energy, that take a short period of time to be re	enewe	d.	
		()
	2. Natural resources of energy that take a very long period of time	,		,
	to be formed.	()
	3. It is a form of biofuel that can be made from some types of plants	,		_ \
	such as grass and wood chips.	(,
	4. They are fuels that were formed from remains of dead animals	(.)
	and plants under the Earth's surface.	ts		-,
	5. It is a form of fossil fuel that was formed from remains of dead plan	()
	under the effect of extreme heat and pressure. 6. It is a form of fossil fuel that was formed from dead marine animals	. (
	6. It is a form of fossil fuel that was formed from dead married and the	,		

Complete the following sentences:

- Water is considered from _____ resources of energy, while coal and are from nonrenewable resources of energy.
- 2. The natural resources that can be replaced shortly after being used are called resources of energy.
- The natural resources that are consumed at a rate faster than they can be renewed are called resources of energy.
- Different forms of fuel can be classified into two main types which are and.
- 5. The type of fuel that is produced from living organisms that can be planted is called such as wood and
- 6. Wood and are examples of biofuel, while and are examples of fossil fuel.
- Wood chips and grass can be used to make a biofuel.
- 8. Oil formed from the decomposition of as a result of extreme heat and

Give reasons for :

- 1. Water and wind are considered as renewable resources of energy.
- 2. Coal and gasoline are considered as nonrenewable resources of energy.
- 3. Using wood of trees as a fuel has negative effects on the environment.

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What happens if ...?

- 1. People increase using the wood of trees as a source of fuel.
- The remains of dead living organisms were buried under the Earth's surface over millions of years.
- 3. Decomposition of remains of sea animals under the Earth's surface.

LESSON THREE

Activity [1]

▶ Arrange the following steps to know how fossil fuel is formed :

The remains of marine living organisms were buried and decomposed under sediments and rocks.

Remains of marine living organisms

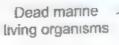


Due to the effect of extreme heat and pressure, the remains of marine living organisms were turned into oil or natural gas.

Oil or natural gas



The death of marine living organisms that have lived since ancient times.





Activity III Without Fundin

- You have learned that fossil fuels such as natural gas and oil are nonrenewable energy resources which are used in generating electricity.
- Recently, renewable energy resources such as wind and water (hydropower) are also used to generate electricity.
- Whatever the resource of energy is renewable or nonrenewable, we should conserve the energy through many ways such as:
 - Turning off lights when they are not needed.



Unplugging electrical devices (appliances) when they are not used.



- Imagine the electric current being cut off while you were studying, you can use simple ways to keep studying, like:
 - Using candles instead of the electric lamps
 - Writing with a pen and paper instead of using a computer.
- So, we can conclude that electrical energy is very important in our lives and we should conserve it.



Check your understanding

▶ Look at the following pictures, then put [✓] in front of the picture showing how to conserve electricity:





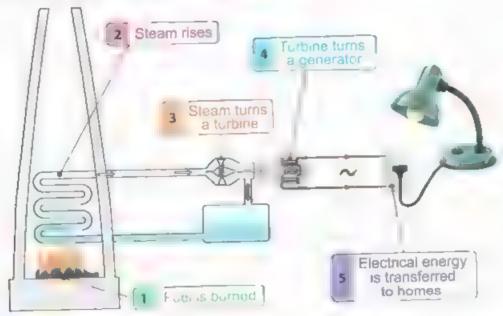


Activity Charles to Committee Charles

- As you knew from the previous lessons that fossil fuels have many uses such as :
 - Using gasoline and natural gas to operate cars.
 - Using oil, coal and natural gas to generate electricity
- Now, we will study how fossil fuel can be used to generate electricity, which is used to light homes.

How fossil fuel is used to produce electricity:

To generate electricity, fossil fuel is burned in the electric power station (power plant) as shown in the following steps:



1 Fuel is burned

When fuel is burned, it produces thermal energy.

2 Steam rises

This thermal energy is used to heat water to make steam.

3 Steam turns a turbine

The steam is directed through pipes and used to turn a device called "turbine".



- The movement of the turbine produces kinetic energy, which is used to operate a generator.
- When the generator is turned on, it converts the kinetic energy into electrical energy.
- 5 Electrical energy is transferred to homes

Finally, the electrical energy travels through wires to homes to operate different devices.



eck your understanding

- Complete the following sentences:
 - When fossil fuel is burned, it produces energy.
 - 2. In the electric power stations, the thermal energy that is produced from burning fossil fuel is used to heat water to form
 - 3. In the electric power stations, there is a device known as that is used to convert the kinetic energy into electrical energy

In the Assessment Book : Try to answer Self-Assessment 7

transfer

generator ينفل

alsé wires

Exercises on Lesson 3

-		and the second	
⊕ Understand	O Apply	@ Higher Thi	nking Skuls
Choose the correct a	answer:		
affected by	organisms that were be to form fossil fuels. Ind high temperature and low temperature and high temperature		
	ctors play an importa	Ut tole in the louns	2(10)1 01 10001 10111
a. extreme pressu	ire.	b. extreme heat d. rocks and sec	
3. All forms of fossil a above the Earth b under the Earth c above the wate d in the air aroun	n's surface. n's surface. er surface. ed us.		
4. All the following a water.	re forms of fossil fuels coal.	natural gas.	oil.
5. The steps of form	ning fossil fuel don't in	clude of the	remains of the living
organisms. decaying	cooling	burying	heating
6. We can use the earenewable resonance and contract and	energy that is produce ources only resources only I nonrenewable resou fruits and vegetables	rces	nerate electrical energy.
7. All the following a unplugging un plugging many turning on all the telephone in telephone in the telephone in telephone in telephone in tel	actions don't conserve used electrical applia y unused electrical ap the house lights all the levision turned on all t	e electrical energy nces. pliances. e day long. the day long.	
8. All the following oil.	can be used to gener natural gas.	ate electrical ener water.	0
9. Inside the electr	ic power station, heat	ing of produ	ices steam. fuel

generators water

turbines

Thanse from column ? I that fire to.

(A)		(B)			-	
Rocks and sediments a. is a liquid fossil fuel, to electricity.		id fossil fuel, that is used to	produce		_	
3. Oil	b. is a liqui energy i	b. is a liquid biofuel, that is used to produce thermal energy in houses.				
	c. is a liqui steam o	d in electric power station to n heating which turns turbin important role in the format	ies.		el.	
1.	2.	3.				
Put (v') or (x):						
	s must be forn	ned under the Earth's surfa	Ce.	1		
2. Oil, natural gas and c	oal can be use	ed to produce electrical ene	rav.	(
3. Turning off lights that	we do not nee	d is a way to conserve elec	tricity.	(
 Burning of fossil fuel i kinetic energy. 	nside electric (power station produces				
	anorator in an	al. 44		(
potential energy,	anerator in an	electric power station produ				
6. We have to conserve	all forms of fue	el.	(Grza 202)	31 {		
1 +				1		
1. Fossil fuels include oil		nd.				
2. After death of living or	ganisms, their	remains are buried under	()	
the Earth's surface and	d exposed to e	extreme pressure and cool	(١	
Water is a nonrenewal	ole energy res	ource.	()	
 In an electric power state thermal energy. 	ation, steam tu	ims turbines that produce			ĺ	
	erator in the of	ectric power station change	()	
kinetic energy into pote	ential energy.	ectric power station change	es		,	
			()	
1. The type of fuel that is	Used incide th	∜ (I				
electricity.	asea mside (n	e electric power station to p				
2. The device in the electronic	ric power static	on, that produces kinetic en	eray to or	Mara 4)	
generators.			()			

3	. The matter that produces steam on heating, which is used to turn turbines in electric power station.)
_	The device in the electric power station, that converts kinetic energy into electrical energy.)
T		
	. In electric power station, we use fossil fuels such as oil and natural gas which are considered as resources of energy.	
• ;	2. Water is considered as	
I	3. When fuel is burned in an electric power station, it produces energy heat water.	to
	Generators in electric power stations change energy into energy.	
	 During generating electricity in electric power stations, the hot water produce which is used to turn turbines. 	5
	6. Turbines in electric power stations are turned by steam to produce energy required to operate the of the electric power stations.	
	7. Inside electric power stations, the burning of fuel produces energy, while the movement of turbines produces energy.	
P	Give reasons for : 1. Generators are important in electric power stations.	
	2. We must turn off lights that we do not need.	
- 8	What happens to .	
•	A generator that is connected to a damaged turbine in an electric power stat	ion.
	2 The movement of the turbine if the water in an electric power station is not heated.	

b ' 1 ' '	. 1				
	,				
To generate electricity	y inside electric po	wer station,	,		1
we need to the	tuel.		911		1
b mix water with	a cool				10
burn				A.	
mix sand with			in this		
Steam in electric pow	or station is send.		Electric pov	ver station	1
a. heating water.	er station is prout				
c. cooling water.		b. mixing water			
3. On generating electric	city inside electric	d. cooling fuel.			
energy which is produ	ced from burning	of fuel.	is the fi	rst type	of
a. electrical energy	3	b thermal ener	mv		
c. potential energy		d kinetic energ			
4. The generator in elect	ric power station i		nergy into	ener	COLV.
a electrical – kinetic		b. electrical - tl	- +	OHE	gy.
c thermal – electrical		d kinetic – elec			
The movement of turb	ines produces	energy.			
a kinetic		b potential			
c. chemical		d hydropower			
1. Turn off lights you do r	ant mond				
2. Let electrical devices y				()
				()
Use energy-saving light				()
4. Leave television turned	on all the day lo	ng.		()
	and the same				
() Steam turns the tur	bine that produce	s kinetic anaras			
() Fuel is burned and	Droduces thermal	S Killetic energy.			
() Electrical energy is	sent to house to	energy.			
() Water becomes had	sent to nouses an	nd factories.			
() Water becomes hot					
() Turbine turns the ge	enerator that prod	uces electrical er	nergy.		

LESSON FOLIR

Activity By Cry Control Troblem

▶ Put (✓) in front of the picture that shows environmental pollution :







In this activity, we will study that fossil fuels have negative impacts in big cities, where the increase of people's needs and their industrial and agricultural activities cause pollution problems around the world.

Some causes of pollution in big cities



Smog produced from burning of fuels pollutes the air.



Pesticides used in farms can be carried into water in canals and rivers when rain falls. this leads to pollution of soil and water.



Chemicals used in many factories pollute the air and also the nearby water and soil.

Some effects (impacts) of air pollution on human's health:

- Smog from cars causes irritation of human's eyes and lungs
- Scientists have found that smog is full of small particles that the human breathes in, these particles irritate the lungs, causing the damage of tissues of the respiratory system.



Check your understanding

- Complete the following sentences:
- 1. Smog from cars causes irritation of human's

Burning fuel produces

, which pollutes the

and

concerns mpact smog

،cana مجاوف ر مسکنت imtation بابير damage نضیان سجانی

andustnat व्यक्त agricultural pesticides سف

chemicals صابيه particles tissues مبدت حسرية

مواد كيميائيه أستحك

Activity 10 Charles I had believed

- You have learned that burning fossil fuels to generate electrical energy pollutes the environment.
- People need energy to operate trains, cars, ships and even more energy is needed to supply houses, schools and factories with electricity.
- To get this energy, people use fossil fuels, where:
- Coal, oil or natural gas are burned in electric power stations and the energy produced from burning fuel is used to generate electricity.
- Then, the generated electricity is transferred to different places through electric wires.



Harms of burning fossil fuels on the environment:

Although burning fuel is used to generate electricity, but it makes pollution, where burning coal and oil produces carbon dioxide gas which causes:



Acid rain

Carbon dioxide gas can combine with water in the air to form acid rain that leads to:

- The death of trees.
- The change in the chemical nature of lakes and kill fish.
- The change in the chemical nature of soil.
- Dissolving some rocks including the rocks used for building.

@ Global warming

Increasing the amount of carbon dioxide gas in the air forms a layer in the atmosphere that traps heat on Earth causing a slow rise in the Earth's temperature, which is known as global warming.

اليناه

How to reduce acid rain and global warming:

The best solution to reduce acid rain and global warming is to conserve energy, where:

As we our usage of energy, the amount of burning fossil fuel to generate energy decreases.

As the amount of burning fossil fuel , the amount of carbon dioxide and other pollutants in the air, which we breathe in, will

Note

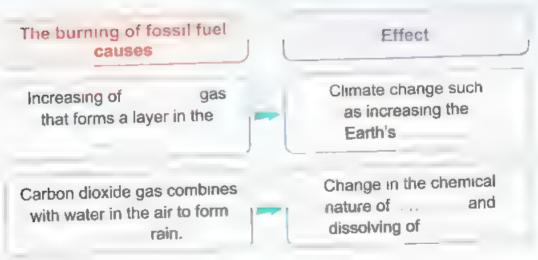
Conserving energy not only reduces pollution but also conserves nonrenewable fossil fuels and keeps the Earth clean.



Check your understanding

▶ "Fossil fuels cause air and water pollution".
Based on this statement, complete the following sentences using the words below:

(temperature – lakes – atmosphere – carbon dioxide – rocks – acid)



- ▶ You have learned that how fossil fuels are burned to generate electricity that lights our houses, so we should conserve this type of fuel, where:
 - · Fossil fuels are formed over millions of years, this means that fossil fuels cannot be replaced as quickly as we use them.
 - There is a limited amount of fossil fuels available on the Earth.
 - Fossil fuels will run out from the Earth, if we don't reduce using fossil fuels.



Walking or using bicycles instead of driving a car



Turning off the lights when you are not in the room.



Replacing fossil fuels with renewable energy resources such as : water, wind and solar energy.

Disadvantages of using fossil fuels to produce energy:

- When some forms of fossil fuels are burned, they release gases that cause :
 - Air pollution.
 - Trap heat in the atmosphere causing "global warming" which raises the temperature of Earth and changes its climate.

Note

Using renewable energy resources instead of fossil fuels means that our energy resources will not run out, so this will not cause an increase in Earth's temperature but it costs more money to produce energy from renewable resources than from fossil fuels.



In the Assessment Book Try to answer Self-Assessment (8)

Put (√) or (x):

- 1. The amount of fossil fuel on Earth is unlimited.
- 2. Producing energy from renewable resources costs less money) than producing energy from fossil fuels.
- 3. Using cars instead of bicycles is a way to conserve fossil fuels.
- The gases released from burning fossil fuels pollute the environment.

firmited disadvantages

agazo cost available مساوئ

climate بكلف betimiles add

غير محدود

Exercises on Lesson 4

O Higher Thinking Skills Understand O Apply Choose the correct answer: 1. Air pollution is usually caused due to of fuel. burning freezing warming cooling To decrease the pollution in a city to its lowest limit, we have to build a factory ... that uses coal, inside the city. that uses oil, inside the city. that uses fossil fuel, inside the city. that uses natural gas, outside the city. 3. Smog causes irritation of of humans. b. eyes and lungs a stomach and eyes d. large intestine c small intestine 4. Smog contains tiny particles that damage the human respiratory system. b. damage the human digestive system. c. help the human body grow up. d keep the human body healthy. combines with rain water. Acid rain is formed when b. carbon dioxide gas a. oxygen gas d. sand c dust 6. All the following are harmful effects of acid rain, except a global warming. b. death of trees. c. change in the chemical nature of lakes. change in the chemical nature of the soil. To reduce pollution with smog, we have to operate cars by coal. electricity. charcoal. gasoline. 8. We must fossil fuel at first, to obtain energy. d. burn. c. cool b cook a wash to be formed under the Earth's surface. 9. Fossil fuels need b. ten years a. five years d. millions of years c. hundreds of years 10. To conserve fossil fuels, we have to do all the following actions, except a. replacing gasoline with natural gas. replacing gasoline with solar energy. c. replacing natural gas with solar energy. Cairo 2023 d. replacing coal with wind energy.

1	Burning fossil fuel produc	es gases that				
	help human to respire.	help animals survive.				
	c. pollute the air.	d benfit the environment.				
1	All the following energy re the Earth, except	esources cause increasing the temperature of				
	a. solar energy. b. coa	al. c. oil, d wood.				
1	changing the Earth's cli	s are related to the global warming, except mate. trapping heat in the atmospheremperature. Increasing the Earth's temperature.	ere. atu	re		
	+ t 1 t 6 %	stacts to second A,				
	(A)	(B)		_		
	1. Acid rain.	a it is a liquid that is considered as renewable resource of energy. b. it is a gas that is necessary for respiration of living organisms.				
	2. Carbon dioxide gas.					
3. Water.		c. it is a gas that causes trapping heat on Earth when it increases in air.				
		d. it is formed when carbon dioxide gas comb with water in the air.	oine	25		
•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3.		_		
	Put (v') or (x) :					
1	1. Smog doesn't cause any da	mage in the human respiratory system.	(
		,Ale	x 20	22		
	2. Acid rain causes soil and v		(
	3. Global warming can dissol		(
	. The heat trapped on Earth		(
	5. Acid rain helps trees to sur		Ċ			
6	To reduce pollution and col	nserve nonrenewable resources of energy,	•			
	we must decrease their use	9.	(
7	. When burning fossil fuels in	creases, the temperature on Earth decreases.	i			
8	 As a result of global warming 	ng, the temperature on the Earth increases	1			
9	 To conserve fossil fuels, we of energy. 	e have to replace them with renewable resource	S			
ın		ne bad effects of using fossil fuels to produce	(
v		IS USU BIJECTS OF DEPOS TASASI SANTA 1				

	3 1 1			
1	1. 1	The amount of renewable resources of energy are limited on Earth.	()
	2.	The amount of biofuels cannot be replaced as quickly as it is used.	()
	3. (Gases released from burning fossil fuels always clear the air	()
		Wood is considered a nonrenewable resource of energy.	()
		Nonrenewable resources of energy will not run out as they are used.	()
		Wood is a fossil fuel that is used in warming houses.	()
		Gases released from fossil fuels on burning decrease the temperature on Earth.	(.)
		Renewable energy resources are natural materials that are consumed at a faster rate than they can be renewed.	()
		rite the scientific term of each of the following:		
1	,	It is a phenomenon in which the Earth's temperature increases, when carbon dioxide gas increases in the air.	()
		It is a system in the human body that is damaged due to breathing a big amount of smog.	(****************)
		It is a type of rain that is formed when carbon dioxide gas combines with water in the air.	(.)
		The type of fuels that when burned, it produces gases which pollute the air.	()
		The increase of the temperature on the Earth, as a result of burning fossil fuels.	()
r	3			
L	1.	When pesticides mix with water in canals, this causes the pollution and	of	
	2.	Factories may cause pollution of , and chemicals they use.	due to the	
	3.	Smog leads to pollution that causes irritation of of humans.	and	
	4.	Tiny particles found in lead to air pollution that causes datissues of the human . system.		
	5.	Burning coal and oil produces gas, which combines with air forming acid	ir	1
	6.	. Increasing the burning of fossil fuel produces more gas t	hat causes	

7.	Acid rain leads to change in the chemical nature of lakes causing death of			
8.	Burning coal and oil produces atmosphere causing rise in the Earth's as		r in the lenon known	
9.	The change in the chemical nature of to the death of trees.	due to	rain may lead	
· 10	To conserve fossil fuels, we can replace energy such as water, and	e them with renewable re	sources of	
· 11.	Global warming causes the raise of	on Earth and chang	es its	
12.	When fossil fuel is burned, it releases trap in atmosphere.	that cause air po	ollution and	
13.	If people do not conserve using of	fuels, they will run o	ut on Earth.	
14.	Using the resources of energy	costs more money than u		
15.	To avoid air pollution, we must use , solar energy and	resources of energy		
7 G	ive reasons for :			
1 .	Smog of cars is very dangerous to huma	an health.		
2.	Farmers must decrease the use of pesti	cides.		
3.	Increase the burning of fossil fuel cause	s acid rain.		
4.	Global warming occurs due to the increa	ase of burning coal and o	il.	
5.	Acid rain has a bad effect on buildings in	cities.		
6.	Fossil fuels cannot be replaced as quick	ly as they are used.		
7.	To keep the air clean, we must replace for energy.	ossil fuels with renewable	resources of	

8 What happens

- 1. If pesticides mix with water of canals and rivers.
- 2. If factories decrease their use of chemicals.
- 3 If acid rain falls on buildings for a long period of time.
- 4. If people decrease burning fossil fuels.
- 5. To the amount of fossil fuels if people don't conserve their usage.
- 6. To the Earth's temperature if we use renewable resources of energy instead of fossil fuels.



- People in city number have
 the highest percentage of eyes' diseases.
 - a. ①
- b. (2)

c. (3)

- d. 4
- City number has the least percentage of air pollution.
 - a. ①

b. (2)

c. (3)

- d. 4
- 3. City number is the most one that needs to change the type of fuel to decrease the air pollution in it.
 - a. (1)

b. (2)

c. (3)

d. (4)

Cities

are less

Percentage of

40

30

20

- 4. People suffer from respiratory system diseases in city number than those in city number 1.
 - a. (1)
- b (2)

c. (3)

d. (4)

10	The	different	forn s	off 55	fues	di ⊨ (L. Orte	1 30 16	÷.,	a, of analys or
	E., 1	tr .	, ⊢ , 1	н	. 31	, m				

Choose the correct answer:

- If we don't conserve using fossil fuels, their amount will not change on the Earth.

 increase on the Earth.
 - c be constant on the Earth. d run out on the Earth.
- 2. To conserve fossil fuels, we must do all the following actions, except
 - a using energy-saving light bulbs.
 - b. using fossil fuels more than solar energy.
 - c. using bikes more than cars.
 using renewable resources of energy more than fossil fuels.
- 3. Fossil fuels are characterized by all the following, except
 - a, they have limited amount.
 - b. they produce thermal energy on burning.
 - they are renewable resources of energy.
 they are nonrenewable resources of energy.
- All the following resources are considered nonrenewable resources of energy, except
 - a. charcoal. b natural gas. c coal. d. oil.



Activity | | |

Put (√) or (x):	•	Put	(1	j	or	(X)	
-----------------	---	-----	----	---	----	-----	--

1. Fossil fuel is used in cooking food.	()

- 2. Fossil fuel is used in generating electricity to light houses. ()
- ▶ In the previous lessons, you have learned about types of fuels, their forms and their uses, and you also have learned that different forms of fuels can be classified as renewable or nonrenewable energy resources.
- The following table shows the renewable energy resources and nonrenewable energy resources:

Renewable energy resources	Nonrenewable energy resources
Solar energy	Coal
Water	Gasoline
Charcoal (is made from wood)	Oil
Wind energy	Netural age
Wood	Natural gas



Check your understanding

Choose the correct answer:

1. Water is considered as a _____energy resource.

(renewable - nonrenewable)

2. Charcoal is made from

(oil - wood)

3. Coal is considered as a energy resource.

(renewable - nonrenewable)

is considered as a renewable energy resource.

(Gasoline - Wind energy)

Activity Record Evidence Like A Scientist

- In this concept, you have learned a lot about some types of fuels, their forms and their uses.
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in the previous concepts.

1 The Question

Where does the fuel we use every day come from?

2 My Claim

3 My Evidence

4 My Scientific Explanation

Review on Concept (3.2)

To review this concept look at the Assessment Book "Part 2: Final Revision"

In the Assessment Book:

Try to answer

- Self-Assessment (9)
- Model Exam on Concepts (3.1) & (3.2)

Exercises on Lesson 5

	● Understand	О Арэду	Higher Think	ing Skills	
	Choose the correct answ	ver:			
D	Both coal and charcos are renewable reso are examples of bic	urces of energy. Ifuel.	produce therma	e resources of end	
	All the following resource except	rces are consider	ed renewable resou	rces of energy,	
	water.	wind energy.	gasoline.	solar energ	у.
	 Among the following r solar energy and co c wind energy and oil 	pal.	st conserve solar energy an d oil and coal.	d wind energy.	2023
	4.2		(0)		
	(A)		(B)		_
	1. Wood. 2. Coal. 3. Wind energy.	pollute the air b. it is a biofuel t c. it is a biofuel t	ble resource of energeners hat is used in warming hat is produced from el that pollutes the a	ng houses.	ned.
	1.	2	3		
-	Put () or () o	in made from corr to produce energ	n can be replaced as	Cairo 2023 (
	4. Wind energy will run o	out faster than nat	tural gas.	(()
Çi.	1. A renewable resource 2. A nonrenewable reson 3. A method of conservin 4. A disadvantage of usi	urce of energy: ng fossil fuels: ng fossil fuels to p	produce energy :		
	5. An advantage of usin	g renewable reso	urces to produce en	ergy .	

Model Enum 1 = n Concept (3.2)



Me Condu a personal		i 5 ma	1189)
1. Fuel is the matter that produce	s electrical energy on burning.	()
2. Wood is a form of fossil fuels the	hat can be used in houses.	()
3. The amount of all types of biofi	uels cannot be replaced as quick	ly	
as it is used.		()
4. Gases released from burning f	ossil fuels always clear the air.	(_)
(B) What happens to? The Earth's temperature if we fossil fuels.	use renewable resources of ene	gy instead of	
(A) Choose the correct answer:		(5 ma	rks)
Coal is formed under the Earth			
a. dead animals.	b. dead plants.		
c. dead humans.	d. dead insects.		
Among the following resources	, we must conserve		
solar energy and coal.	solar energy and wind ene	ergy.	
c. wind energy and oil.	d oil and coal.		
All the following are found deep	bly under the Earth's surface, exc	ept	
a. natural gas,	b coal.		
c green plants.	d oil.		
All the following are used to get	nerate electrical energy, except		
a. oil.	b natural gas.		
c. water.	d. glass.		
(B) Give a reason for the following	g:		
Cutting trees to obtain wood ha	as negative effects on the enviror	nment.	





(5 marks)

- Some forms of fuel can be used in cooking such as wood, and
- The generator in the electric power station changes energy into energy.
- 3. Using the resources of energy costs more money than using fossil fuels.
- 4. Different forms of fuel can be classified into two main types which are and

(B)			
a. it needs extreme heat and pressure to be formed			
from remains of dead plants.			
b. it is the main resource of energy on the Earth's			
surface.			
c. it is a gaseous renewable resource of energy.			
d it is a liquid renewable resource of energy.			

1. 2. 3. ..





on Concept (3.2)

						_
a f riset our	f V				(5 ma	arks)
1. Ancient people u	sed a	as a fuel bef	ore discovering ga	asoline.		
a electricity	b. water		c wind	d wood		
2 All the following	are forms of fo	ossil fuels, e	xcept			
a. water.	b. coal.		c. natural gas.	d oil.		
3. Acid rain is forme	ed when	combine	s with rain water.			
oxygen gas	carbon d	ioxide gas	dust	sand		
4. We must	fossil fuel at	first, to obta	in energy.			
a wash	b. cook		c. cool	d burn		
(B) Give a reason for	or the followi	na :				
Generators are		_	er stations.			
					r 5 ma	irks)
1. The main source	of most form	s of energy	on the Earth's sur	face. ()
2. It is a liquid form	of fossil fuel t	that was forr	ned from dead m	arine anima	ls.	
0.71				()
3. The energy resour)
4. The device in the	electric power	station, that	converts kinetic en	ergy		
into electrical ener	-			()
(B) What happens t						
The amount of f	ossil fuels if p	eople don't	conserve their us	age.		
(A) Put (✓) or (X):					(5 ma	-t-1
1. Wind energy will	run out faster	than natura	I gas.		(3 ma	/ <i>KS/</i>
2. Turning off lights			-	lectricity	,) \
3. We can make liqu	id biofuel fron	n wood chips	s and orass.	noon tony.	/	/ \
4. As the speed of t				lecreases	/	/
(B) Cross out the oa					,	,
Oil - Coal - Cha		al nas				
	THE PERSON NAMED IN	SALE SALES .				1,

Renewable 3.3 Energy Resources





Learning outcomes

By the end of this concept, your child will be able to:

- Apply scientific ideas to design, test and refine devices that convert energy from one form to another.
- Explain the use of renewable energy resources in the generation of electricity.
- Develop models based on observations and evidence that energy is transferred from place to place.

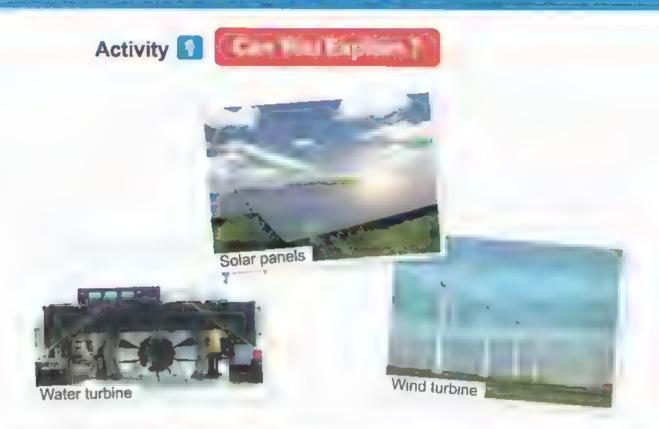
Key vocabulary

- Heat
- Turbine
- Light
- Watermills
- Radiation
- Windmills
- Solar energy

Notes For Parents Di Compatible

Lessons	Activities	What you should do with your child
	Activity 1	Explain to your child the different ways for generating electricity using renewable energy resources
1	Activity 2	Discuss with your child the differences and similarities between windmills and watermills.
	Activity 3	Discuss with your child about the uses of solar energy
	Activity 4	Discuss with your child the importance and uses of solar panels
2	Activity 5	Explain to your child how wind energy can be used to generate electricity
	Activity 6	Discuss with your child how the energy of running water can be used to generate electricity.
3	Activity 7	Let your child do a model of water turbine and to know the meaning of water cycle.
4	Activity 8	Help your child to think like a scientist by answering a question about one of the main points of this concept, then write his/her claim, evidence and the scientific explanation.

LESSEN DINE



In the previous concept, you have learned that the renewable energy means that it does not run out faster than we use.

▶ What are the different ways we can use renewable energy to generate electricity?

- From the previous pictures, we notice some examples of renewable energy resources which are solar energy (sunlight), wind and water.
- Generating electricity by using the previous renewable energy resources in different ways, where:
 - So ar panels generate electricity by using the solar energy, which is used to operate light posts in streets.
 - Wind turbines generate electricity by using the kinetic energy of wind.
 - Water turbines generate electricity by using the kinetic energy of water.

In this concept, we will study:

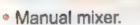
- Windmills and watermills.
- Renewable energy resources.
- The Sun and the use of solar energy.
- Ways to generate useful energy using the wind movement.
- Ways to generate electricity using the kinetic energy of water.

Activity 2



▶ Put () in front of the device that generates electricity:







Water turbines.



Wind turbines.

,

- You know that most of the devices around us require electricity to be powered, but how did humans powered machines hundreds of years ago before electricity?

Windmills and watermills:

- Hundreds of years ago, people needed machines to make their lives easier, for example, they used windmills and watermills which helped them to crush (grind) grain to make flour.
- The following table shows the advantages, disadvantages and energy used in windmills and watermills:

Points of comparison	Windmills	Watermills
Energy used :	The wind movement generates kinetic energy which moves the mills' blades, then kinetic energy transfers to other parts of the mills to crush the grain.	The water movement generates kinetic energy which moves the mills' blades, then kinetic energy transfers to other parts of the mills to crush the grain.
Advantages:	Low cost. Renewable energy resource.	Low cost. Renewable energy resource
Disadvantages:	Sometimes the wind does not blow, so the windmills do not move, so they are unable to do their job.	Sometimes the water source may dry up, so the watermills do not move, so they are unable to do their job.

طحين/دقيق

Old mills and modern turbines:



Old windmills

- They use wind as an energy resource.
- They have openings in their blades.
- They have more blades than those of the modern wind turbines.
- They are shorter than the modern wind turbines.
- They are used in crushing grain.



Modern wind turbines

- They use wind as an energy resource.
- They don't have openings in their blades.
- They have fewer blades than those of the old windmills.
- They are taller than the old windmills.
- They are used in generating electricity.



Old watermills

- They use the movement of water as an energy resource
- They are used in crushing grain.



Modern water turbines

- They use the movement of water as an energy resource.
- They are used in generating electricity.



Check your understan

▶ Put (√) or (x):

- 1. All mills depend on the kinetic energy of wind only in order to be operated. (
- 2. From the advantages of windmills and watermills is that they are low cost. (
- 3. The kinetic energy of water is responsible for the movement of windmills.

Activity 3 Daing Energy Inches

- The Sun is the main source of energy on Earth as it provides us with light and heat.
- Living organisms need the Sun to survive.
- In this activity we are going to know how the energy of the Sun reaches us on Earth and how we use it in our daily life.
- At night when the Sun is not visible in the sky, you can feel warm because :
 - The atmosphere absorbs the energy of the Sun.
 - The land and water on Earth's surface absorb the energy of the Sun, which causes increasing in the Earth's temperature.

Solar energy:

- The energy coming from the Sun is called "solar energy", which contains light and thermal energies from the Sun.
- The solar energy that is produced by the Sun contains a type of energy called "radiant energy" or "radiation" which is found in the sun rays.

Uses of solar energy:

Direct source of thermal energy

Solar energy can be used directly as a source of thermal energy when exposing yourself to the sun rays to feel warm.



Warming houses

Houses can be built in a way that enables the energy of the Sun to warm them by placing large windows on the walls that face the Sun for most of the day.



Greenhouses

- Greenhouses are used to plant the crops that only grow in warm climate.
- Greenhouses allow the entry of solar energy (especially radiant energy), then this radiant energy is converted into thermal energy that warms the inside of the greenhouses.



Greenhouse

Cooking food

- Where, convergent mirrors (concave mirrors) are used to collect and focus sunlight (sun rays) to heat metal pots and cook the food inside.
- Convergent (concave) mirrors are curved mirrors as shown in the opposite picture.



Solar water heater

- It consists of panels made of black pipes can be placed on the roof of houses.
- It is used to heat the water when it passes through these pipes, then the heated water is stored in a water tank to be used later.



Solar water heater



Check your understand

▶ Complete the following energy chains:

	energy	Converted into	energy	У
	(From the Sun)		(In greenho	uses)
energy	Converted into	energy	Converted unto	energy
(From the Sun)		(in solar panels)		(in lighting lamps)
				In the Assessment Book Try to answer Self-Assessment 10

Entercises on Lineaun 1

O Asetu Higher Thinking Skills Choose the correct answer: 1. All of the following are examples of renewable energy resources, except d. sunlight. a, fossil fuel. b, waterfalls. c. wind. (Cairo 2023) 2. Solar panels use solar energy to generate energy which is used in lighting houses. d kinetic c. potential b. electrical a. sound energy which moves the windmill's blades. 3. The wind movement has d. potential c. thermal b. solar a. kinetic 4. Both modern wind turbines and modern water turbines are similar in their b ability to generate electrical energy. a shape. d ability to generate potential energy. c blades number. In the absence of sunlight, all the following items will be negatively affected, except d. animals. c. rocks. a. plants. b. human. energy into energy. Solar water heater changes b. solar - sound a. electrical - thermal d. solar - thermal c. electrical - sound 7. The two forms of energy that transfer from the Sun to the Earth in the form of waves are energy and energy. b. sound - thermal a. electrical - light d. light - thermal c. thermal - chemical 8. When land and water areas on Earth absorb the solar energy, the on Earth increases. d. ice c. water b. rocks a. temperature $(a \rightarrow 2023)$ energy in greenhouses. 9. The solar energy is converted into d. potential c. thermal b. sound a. electrical * 10. Greenhouses allow farmers to plant crops that only grow in b. warm climate. a. polar climate. d absence of water. c. absence of sunlight.

2 11. Using convergent sheets in cooking food is one of the benefits of using

b. plastic

c. mirror

d. wooden

the solar energy.

a. paper

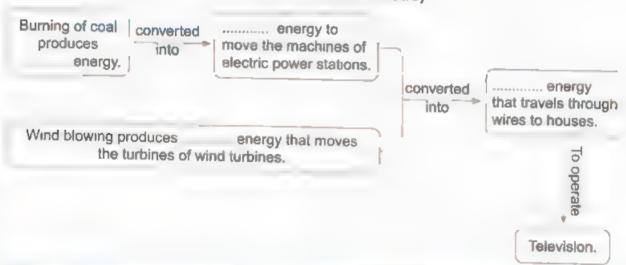
Choose from column (B) what suits it in column (A):

c. are the two main forms of energy produced from the Sun. d. is the form of energy produced from solar panel Put (v) or (x): 1. Wind turbines generate electricity by using the energy of water flow. 2. Machines make our lives more easier. 3. The low cost of the energy used in watermills is from the disadvantages of using this energy. 4. Windmills always do their job all the time, because the wind never stop blowing. 5. Both wind movement and water flow have kinetic energy. 6. Both modern wind turbines and old windmills are used to generate electricity. 7. All devices require energy to do their functions. 8. The modern wind turbines have more blades than that of the old windmills. 9. The Sun is the main source of energy on Earth. 10. Living organisms don't need the Sun to survive. 11. The Sun provides the Earth with light and heat. 12. Solar water heater is formed of panels made of black pipes. 13. Placing large windows on the walls that face the Sun helps in warming houses. Correct the underlined words: 1. Solar panels use sound energy to generate electricity. 2. Water turbines generate electricity by using the energy of wind movement. 3. Manual mixer depends on electricity to do its function. 4. The high cost of producing energy in windmills is one of its advantages. 5. In the absence of the light of moon, living organisms cannot survive. 6. Thermal energy and sound energy are produced from the Sun and				
	Light energy and thermal energy	 b. use the energy of the Sun to hea c. are the two main forms of energy the Sun. 	t water in homes produced from	
1. Solar water heater 2. Light energy and thermal energy 3. Kinetic energy 3. Kinetic energy 4. Light energy 5. Kinetic energy 6. Light energy 7. Light energy 8. Kinetic energy 9. Light energy 9. Light energy 1. Light energy 2. Light energy 3. Kinetic energy 1. Light energy produced from solar panels. 1. Light energy 1. Light energy produced from solar panels. 1. Light energy 1. Light energy produced from solar panels. 1. Light energy pro				
	Due (A) on (A)	•		
ľ				
Ī	2. Machines generate	electricity by using the energy of water	er flow. (
			(
	of using this approx	ergy used in watermills is from the disa	dvantages	
,			(
	ston blowing	eir job all the time, because the wind r		
		med symbol flow 1	(Behira 2023) (
0	6. Both modern wind turbi-	nd water flow have kinetic energy.	(
	7 All devices require and	nes and old windmills are used to generate	ate electricity. (
			(
Γ	9. The Sup is the see:	nes have more blades than that of the	old windmills. (
, -			2023 (
			(
			Br. + 2023 (
1	2. Solar water heater is fo	rmed of panels made of black pipes.	(
<u>'</u>	o. Placing large windows of	n the walls that face the Sun helps in wa	rming houses.(
	Correct the underlined w	ords:		
	 Solar panels use sound 	energy to generate electricity.	(
	Water turbines generate	e electricity by using the energy of wind	d movement	
			(.	,
,	Manual mixer depends	on electricity to do its function.	(1
-	1. Solar water heater 2. Light energy and thermal energy 3. Kinetic energy 3. Kinetic energy 3. Kinetic energy 4. Light energy 3. Kinetic energy 5. Light energy 6. Light energy 7. Light energy 8. Light energy 9. Light energy 9. Light energy 1. Light energy 2. Light energy 3. Kinetic energy 4. Light energy 1. Light energy 1. Light energy 1. Light energy 2. Light energy 3. Kinetic energy 3. Kinetic energy 4. Light energy 5. Light energy 6. Light energy 7. Light energy 8. Light energy 9. Light energy 9. Light energy 9. Light energy 9. Light energy and the sum of energy produced from solar panels. 9. The low cost of the energy used in watermills is from the disadvantages of using this energy. 9. Light energy 9. Light energy 9. Light energy 9. Light energy to disadvantages of using this energy 9. Light energy 9. Light energy 9. Light energy to disadvantages 9. Light energy to disadvantages 9. Light energy to disadvantages 9. Light energy energy energy 9. Light energy 9. Light energy 9. Light energy energy 9. Light energy energy 9. Light energy 9. Light energy energy 9. Light energy 9. Lig			
			(.)
	Thermal ansence of the lig	nt of moon, living organisms cannot so	ırvive. ()
1	reach the Farth	ind energy are produced from the Sun	and	
	and the same of th		f	- }

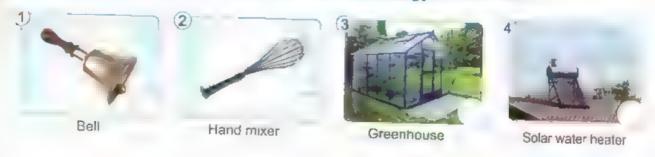
	W	rite the scientific term of each of the following:		
	1 .	A mill that is turned by water flow	inia 2023) ()
	2.	A mill that is operated by wind movement.	ofia 2023, ()
6	3.	The type of energy that is produced from wind turbines to o	operate	
		diffordit florid do rioso	ailia 2023) (=)
		An equipment that is used to convert the kinetic energy of	wind	\
		into electrical energy.	nto motal r	ote /
		A type of mirrors that is used to collect and focus sunlight of to heat them and cook the food inside.	(,)
	6.	They help farmers in cold regions to plant crops which grow	w only in	,
		Watti Contractor	ubia 2023) (.)
	7.	An equipment consists of panels made of black pipes that heat water at houses.	is used to (.)
		Treat water at 1100000.		_
		omplete the following sentences :		
-	1.	In electric power stations, the burning coal produces electricity, while wind turbines generate electricity by using the	energy to g ener	generate gy of wind.
	2	The water flow has kinetic energy, which moves the transform this energy into energy.	of water tur	bines to
ı	3	. Both and are used to crush grain hundreds of	years ago.	
ì		. Although modern wind turbines and old windmills vary in s energy to be powered.	hape, they	all use
ı	5	Both wind and water movement produce energy that	t is used to	rotate
ľ		turbines to generate energy.		(Cairo 2023)
1	6.	. The solar energy is produced from the , and the this energy which is carried by sun rays.	= energy is	s a type of
	7	. When we expose our bodies to the Sun, we feel		
		We can use solar energy in cooking by using focus onto metal pots to heat them.	which colled	et and
_	Ω	. Greenhouses convert the radiant energy of the sun rays is	nto er	nergy that
P	9	allows farmers to plant crops which grow in climate	s. 	
1	10	Give reasons for:		
	1	. Humans used windmills and watermills from hundreds of	years ago.	
		2. Sometimes the Sun is not visible in the sky but you can fe		th.

- 8 What happens if ...?
 - 1 Wind doesn't blow in an area that contains many modern wind turbines.
 - 2. Sunlight falls on solar panels.
 - 3. Sunlight falls on a greenhouse.
- Complete the following energy chain by using the energies below: (You may use each word more than once).

(thermal - electrical - kinetic)



Put (V) in front of the pictures in which solar energy can be used:



LESSON TWO

Activity 4 Solar Energy

▶ Put (√) or (×):

- 1. The Sun gives us warmth and light.
- 2. The main source of energy on Earth is the moon.
- You already know the source and uses of solar energy.
- Now, we will study how solar panels convert solar energy coming from the Sun into electricity.

Solar panels:

Solar panels can be very small that they can supply only one light bulb with energy, or very large that they can supply buildings or cities with energy.

How do solar panels work?

- Solar panels are composed of many small solar cells.
- These cells capture solar energy (especially radiant energy) coming from the Sun and convert it directly into electrical energy.
- Solar panels are used to generate electricity.

Converted into Radiant energy

Electrical energy

(From the Sun)

(In solar panels)



Solar panels

Uses of electricity generated by solar panels:

- This electricity can be used directly to light the streets.
- This electricity is used to recharge some types of batteries, like some calculators with small solar cells.
- This electricity is used in houses to operate various electric devices.
- This electricity is used to operate irrigation equipment in some villages.



Calculator with small solar cells

Check your understanding

▶ In the table below, classify the following energies in the solar panel system into input and output energy:

(Solar energy – Electrical energy)

(30101 0114.33	
Input energy	Output energy

Activity 5 Harness the Wind

You have learned about the renewable energy resources such as the Sun, water and wind. Now, let's know how wind turbines convert kinetic energy of the wind into electricity.

Using energy of the wind :

Different amounts of solar energy (especially radiant energy) reach different regions of the world.



Radiant energy heats up the air around the Earth to different degrees, where the difference in temperatures between cold air and hot air causes air to move and wind to blow.



- Kinetic energy of the wind movement is used to rotate (spin) the blades of wind turbines.
- When the blades of wind turbines rotate, this causes the rotation of turbines and that leads to generating electrical energy.



This electrical energy is transmitted through big wires to different places such as houses and factories



The following diagram shows the energy chain of the wind turbines:

Radiant energy	Converted into	Thermal energy	Converted	Kinetic energy	Converted into	Electrical energy
(From the Sun)	(causing temperatures vary between hot air and cold air)		(in wind furbines)		(In power nes)	

transmitted degrees

المثل harness مرجات سرجات

spin تسخیر varv اسانک

بدور

○ Note

In wind turbines, when the kinetic energy of wind increases, the blades rotate faster, so the efficiency of wind turbines increases.

	20	7	
1	- '	-	

Check your understanding

	- 4			
1 4 4	1./	479, 147	6 W 3	
LIL	(V)	OI :	しみり	

	at (v) or (v).		
1.	Kinetic energy of the wind is converted into electrical energy by wind		
	turbines.	()
	Wind is a nonrenewable energy resource.	()
3.	The difference in air temperatures around the Earth causes air to move		
	and wind to blow.	()

In the Assessment Book: Try to answer Self-Assessment 11

Enercises on Lesson 2

(U	d	8	rs	ta	П	ď

О Арріу

• Higher Thinking Skills

ĺ.	Choose the correct a	inswer:						
	All the following are from the uses of electricity generated by solar panels except							
	a. operating windmc. lighting streets.	nils.	b. operating irrig		ent.			
4	2. All the following are	e renewable energy	resources, except					
	a. waterfalls.	b. coal,	c. the Sun.	d. wind.				
	Kinetic energy of a. the moon	movement is u b. stars	sed to rotate the bl	ades of wind t	urbin	es.		
	When the blades of leads to generating a electrical	wind turbines rotateenergy. b solar	this causes their tu		lex. 20			
	5. The electrical energia. water.	gy is transmitted from b. wind.			jh			
	6. The electrical energy devices, except a. washing machine c. electric fan.		b. manual mixer. d. electric heater		llowir	ng		
0	7. The change of ener turbine.	rgy in an is op	posite to the chang	ge of energy in	ı a wı	nd		
	a. electric bell	b electric heater	c electric iron	d electri	c fan			
	8. When energy quickly,	of wind increases,	the blades of wind	turbines spin	more			
	a. kinetic	b. potential	c. chemical	d. solar				
Į	Put (🗸) or (X) :							
	1. A solar panel consis	sts of one small sola	r cell.		,	,		
	2. Wind is a renewable			(O=h1 = 00)	,		
	3. There is a similarity		Woon cold and had	(Qalyobia 20.	23) ()		
	4. In wind turbines, the	kinetic energy is or	ween cold and not	air.	()		
		which chergy is co	niverted into chemi		()		
,	5 Electricity generated	by wind turbines is	transmitted throug	(Gé	iro 20.	23)		
	6. When air blows into	the wind turbing wo	akly the Mada	ii wina.	()		
		THE WE	any, the blades spi	in slowly.	()		

H	Correct the underlined words:	
	Small solar panels are used to supply one light bulb with sound energy.	()
	2. Potential energy of the wind is converted into electrical energy by wi	ind turbines.
	3. The difference in temperatures between cold and hot air causes air	to stop.
	4. Water turbines rotate when their blades rotate as wind blows.	()
	5. When air blows into the wind turbine strongly, the blades spin slower	: ()
	Write the scientific term of each of the following:	
	 A panel designed to absorb the energy of the Sun to generate elect 	tricity.
	(Qalyoubia 2023	
	2. A natural movement of air that is resulted from the difference in terr	peratures
	between cold air and hot air.	()
	3. A turbine that uses the power of flowing air to generate electricity.	(Giza 2023)
	 An energy that is generated from wind turbines and is transmitted to to houses and factories. 	hrough wires ()
	Complete the following sentences:	
	 Solar cells that convert radiant energy coming from the sun rays intenergy. 	to
	Solar cells that are found in some calculators produce energy to recharge their	y that is used
	In some villages, solar panels are used to generate energy to operate equipment.	hat is used to
	Wind is formed due to the effect of energy coming from the form of rays.	in the
	5. Wind blows due to the difference in between the cold air and the	ne hot air.
	 The rotation of blades of wind turbines is caused by energy to created by wind movement. 	that is
	7. When wind turbines rotate, energy is converted into en	nergy.
	8. When wind blows into a wind turbine with a large force, its blades than that when wind blows into it with a small force.	rotate
	By increasing the rotation of wind turbine blades, the wind turbine more energy.	generates (Alex. 2023)
	10. When the energy of wind increases, the speed of rotation of	f turbine (Gıza 2023)

6 Give reasons for :

- 1. Some electrical devices have solar panels which are composed of many solar cells.
- 2. Kinetic energy of wind affects the speed of wind turbine blades rotation.
- 3. Sometimes the wind turbines are useless.

What happens if ...?

- 1. The solar cells in a calculator are exposed to sunlight.
- 2. The kinetic energy of a wind that is applied on the wind turbine increases.
- 3. There is difference in temperatures of air around Earth

Complete the following table :

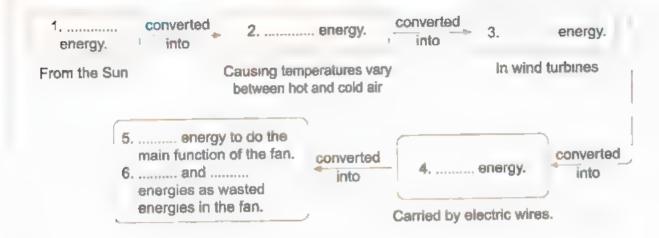
1.	Used energy	Produced energy
Solar panels	energy	energy
Wind turbines	Kinetic energy	energy



Complete the following energy chain of a fan using the words between brackets:

(You may use the same word more than once).

(Thermal – Radiant – Electrical – Kinetic – Sound)



LESSON THREE

Activity 6 Falling Water

		11		4.4	
	Pot	(3 01		N 3 +
_			2 VI		

1. Water is considered as a renewable energy resource.

2. The flow of water can be used in generating electricity

- You have known that wind can be used to generate electricity.
- Now, we will study how water can be used to generate electricity.

Falling water:

- Rivers flow downhill, and during this process the gravitational potential energy of water is converted into kinetic energy that helps water turbines rotate to generate electricity.
- Dams are built on rivers to control the water flow and increase the potential energy of water.
- There is a type of dams called hydroelectric dam which is used to generate electricity using the flow of water.

▶ How can electricity be generated from hydroelectric dams using water turbines?

A hydroelectric dam prevents the flow of river water, so the potential energy of water increases.



When water is released, it flows through water 2 turbines in the dam and the potential energy of water is converted into kinetic energy.



Hydroelectric dam

The kinetic energy of flowing water transfer to water turbines so turbines 3 rotate that operate generators to generate electricity.

This electricity is sent through long electric wires to the places where it is needed, and this type of electricity is called "hydroelectric energy" or "hydroelectricity".

Hydroelectric energy (hydroelectricity):

It is a type of electrical energy generated by water turbines in dams.

The following table shows the similarities and differences between the use of water and the use of wind to generate electricity:

The use of water to generate electricity

The use of wind to generate electricity

Differences

It is used in places where dams are built on rivers.

It is used in places with strong winds.

Similarities

- Both of them are renewable energy resources.
- Both of them use kinetic energy to operate turbines to generate electricity.



Check your understanding

▶ Complete the following sentences using the words below :

(wind turbines - water turbines - hydroelectric energy)

- Water flows through in dams to generate electricity.
- 2. The electrical energy generated by water turbines in dams is known as
- 3. In places with strong winds. are used to generate electricity.

Activity 7 Modeling a Jurbine Generate

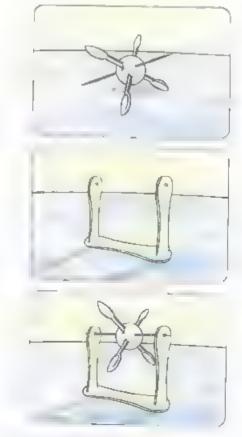
- You have learned how the energy of water movement is used to generate hydroelectric energy.
- Now, you will design a model of a water turbine.

▶ Tools



Steps

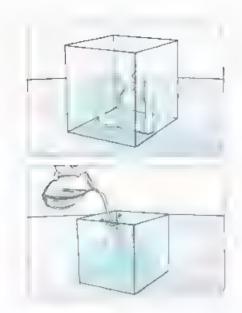
- Make the blades of the water turbine using the ball of cork, four plastic spoons and the toothpick as shown in the opposite figure.
- Make the base of water turbine by using the three wooden sticks and the wax gun as shown in the opposite figure.
- Fix the blades to the base as shown in the opposite figure.



mode	
jug	
fix	

4. Place the turbine inside the bowl.

5. Fill the jug with water, then pour it over the blades.



Observation

The blades rotate when water is poured over them and stop when the water inside the jug is completely run out.

6.When the water in the jug runs out, refill it with water from the bowl and pour water over the blades again.

♦ Observation

The blades start to rotate again.

Conclusions

- The kinetic energy of moving water in rivers is used to rotate water turbines to generate hydroelectric energy.
- If the water flows all the time, the water turbines will be operated all the time.

Water cycle:

- As you have learned that the water is renewable energy resource.
- The river's water doesn't renewed

 (return back) to its source through the dam immediately, but during a process which is happening on Earth known as "water cycle".



The water cycle

Where:

- The river's water flows into other bodies of water and evaporates (water changes into water vapor), then condenses (water vapor changes into water) forming clouds.
- · When rain falls from these clouds, the water returns again to the river



▶ Put (√) or (x):

- Water is a nonrenewable resource that is used to generate hydroelectric energy.
- 2. In the water turbine, kinetic energy is converted into hydroelectric energy.

Review on Concept (3.3)

To review this concept look at the Assessment Book "Part 2: Final Revision".

In the Assessment Book

Try to answer

- · Self-Assessment (12)
- · Model Exam on Theme (3)
- Questions of the school book on Thema (3)

Exercises on Lesson 3

Understand

O Apply

O Higher Thinking Skills

1	Cł	oose the correct ar	iswer:		
0		Water flows through a. electrical	turbines in hydroele b. potential	ctric dams to gene c. solar	rate energy. d. light (Giza 2023)
Ì			e energy of wa b. kinetic		,
ı	3.	The reason of flowing pushing	ng of river water dow b friction	nhill is the fo	orce.
	4.	Using of water to ge a. with strong winds c with weak winds.	-	pends on places b where dams ar d where boats sa	
1	5.	Both waterfalls and a. wind	are renewable b. coal	e energy resources c. oil	d. fossil fuel
	6.	· ·	dam stores er b. thermal	nergy. c. potential	d. electrical
		a. kinetic	d use energy t b. thermal	c. electrical	d. solar
	8.	The form of energy a thermal	resulted from waterf b chemical	alls is called c solar	energy. 2023 d hydroelectric
	9.	Which of the follow a. Running bicycle. c. Running water.	ing is a renewable er	nergy resource ? b. Running car. d. Running perso	n.
	10	In the water cycle, a freezes – evapor c evaporates – fre	rates	before falling b evaporates – o d. condenses – e	
		a. kettles.c. electric heaters.	rates by the help of h	d. electric iron.	
	12	In the water cycle, and returns back to a. clouds	the water evaporate hrough rain falling. b. sand	s, then it condense c. rocks	es in form of d, coal
	13	If the speed of mo	ving water changes t		m/sec, its kinetic
		energy will increas	se. b. 3	c. 4	d. 6

1	☑ Put (✓) or (X):		
	1. Waterfalls are considered as nonrenewable energy resources	3) (,
	2. Electrical energy can be generated from both waterfalls and wind movemen		,
		uro 20) 923,
	Dams are built on rivers to control the wind flow.	()
	4. The flow of water can be controlled to generate electricity in dams.	()
		iro 20) (23)
	When river flows downhill, its gravitational potential energy converted into chemical energy.	,	,
	6. Running water in rivers has kinetic energy.	(,
	7. The energy produced by wind turbines is known as hydroelectric energy.	(,
		()
	The evaporated water from rivers can return back to rivers through the water cycle.	,	\
	9. Water is from nonrenewable energy resource as it evaporates.	()
	Correct the underlined words:		
2	The thermal energy generated by water turbines in dams is known as hydroelectricity.		
	2. During the flowing of rivers water downhill, the chemical potential energy)
	water is converted into kinetic energy.	of	,
	Dams are built on rivers in order to generate solar energy.		=)
		ua 20)
	4. The electrical energy is generated by wind turbines in dams.	10 20	_)
٤.	Write the scientific term of each of the following .		
	A turbine that converts the energy of falling water into electrical energy.		
	()
	2. A type of electrical energy generated by water turbines in dams. ('n
	3. A type of dams that is used to generate electricity using the flow of water.		
	()
	4. A turbine in which the kinetic energy of moving water is used to		,
	generate hydroelectric energy. 2023 ()
	5. A process in which water changes into water vapor.		1

	6. The process in which the water of rivers evaporates, then condenses forming clouds and return back to rivers through rainfalls.
	7. A process in which water vapor changes into water forming clouds. ()
v	Complete the following sentences :
	 When rivers flow downhill, energy of water is converted into energy that rotates water turbine.
	 People build on rivers to control the water flow and increase its energy that is converted into energy in water turbines that is used to light houses.
	 Dams control the flow of that causes the increase of the energy of water.
	4. The type of electrical energy which is produced by water turbines is called
	5. Water and are from the renewable resources of energy which use energy to operate turbines and generate
	6 We can use a device known as wind to generate electricity in places where strong air blows.
	 Water turbines are used to generate electricity in places which have waterfalls or , while wind turbines are used in places with strong
,	Hydroelectricity is generated by using water in dams.
0	9. Renewable energy resources include, and (Behira 2023)
	10. The movement of water in river is used to rotate water to generate electricity.
	11. Both wind and water movement produce energy that is used to rotate turbines to generate energy.
	12. Clouds are formed due to the, then of water of rivers and seas.
	13. In water turbines, the energy of water movement is converted into a type of electrical energy which is called energy. (Cairo 2023)
6	Give reasons for :

2. Water turbines are placed in waterfalls areas.

3. Some dams contain water turbines.

1	What	han	nanc	16	-
to an	AMELGIE	пар	hG112	ы,	** 5

- 1. Water turbines are placed in a dam.
- 2 Potential energy of water increases behind a dam that has water turbines.
- 3. Water of seas and rivers evaporates, then condenses in the atmospheric air.

Complete the following energy chain of a television by using the words between brackets:

(Electrical - Sound - Thermal - Potential - Light - Kinetic)

1 energy.	converted	2 energy.	converted 3	energy
of water behind dams		that causes water turbine moves	_	that travels through wires
		that do the television. 5ene	main function of argy as a wasted the television.	converted

Complete the following table :

Points of comparison	Wind turbines	Water turbines	
Energy used :	energy of wind.	energy of water.	
Type of used energy :	Renewable energy.	energy.	
Produced energy:	energy.	energy.	

Look at the following figure that represents the water cycle, then complete the sentences below:



- 1. The arrow number () represents the evaporation of river's water.
- The arrow number () represents the condensation of water vapor to form clouds.
- 3. The arrow number () represents the falling of rain that make water return back to the river.
- 4. The arrow number () represents the water movement in waterfall that makes the watermill rotate.

LESSON FOUR

Activity 8

- In this concept, you have learnt a lot about renewable and nonrenewable energy resources and the benefits of using renewable energy resources.
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learnt in the previous concepts.

7 The Question

What are the different ways we can use renewable energy to generate electricity?





4 My Scientific Explanation

Model Exam

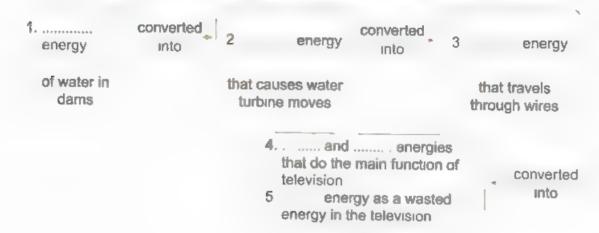




(A) Write the scientific term of each of the following :			_
The main energy which is produced from generators that are cor	nected	to bot	h
water turbines and wind turbines.	(10 000)
2. The main source of energy on Earth.	1)
A turbine that uses the power of blowing air to generate electricity	()
An equipment consists of panels made of black pipes that is	1		•
used to heat water at houses.	(,)
(B) Give a reason for the following :			
Hydroelectric dams are built on rivers.			
(A) Correct the underlined words		,	
Thermal energy and sound energy are produced from the Sun a	nd reac	h the	
Earth.	()
2. When air blows into the wind turbine strongly, the blades spin slo	ower.		
		6111104001110)
3 Solar panels use sound energy to generate electricity.	()
4. During the flowing of river's water downhill, the chemical potentia	al enerç	gy of	
water is converted into kinetic energy.	()
(B) What happens if?			
The presence of solar panels in some electrical devices			
[3] (A) Put (✓) or (X):			h .
 Both wind movement and water flow have kinetic energy. 		()
The hydroelectric energy is produced by using wind turbines.		()
3. Wind is a renewable energy resource.		()
4 The flow of water can't be controlled to generate electricity in da	ms.	()

(B) Complete the following energy chain of a television by using the words between brackets:

(Electrical - Sound - Thermal - Potential - Light - Kinetic)



Model Exam





on Concept (3.3)

(A) Choose the correct answer	1
-------------------------------	---

 In the water cycle, water of rains. , then it

before falling in the form

or rains.

a freezes - evaporates

b evaporates - condenses

c evaporates - freezes

d condenses – evaporates

2. The solar energy is converted into

energy in greenhouses.

a. electrical

b. sound

c. thermal

d. potential

3 The reason of flowing of river water downhill is the

force.

a. pushing

b. friction

c. gravitational

d. electrical

 Some types of lamps in streets depend directly on energy resource in order to do its function. as a renewable

a. sunlight

b. petrol

c. coal

d. natural gas

(B) Complete the following table:

Device	Used e	nergy	Produced	energy
Solar panels	(1)	energy	(2)	energy

(A) Write the scientific term of each of the following:

 A turbine in which the kinetic energy of moving water is used to generate electricity.

/

2. A process by which water changes into water vapor.

()
,	

A natural movement of air that is resulted from the difference in temperatures between cold air and hot air.

()

4. A glass building that is used in cold areas to plant crops which grow in warm climate.

(744884	*****)

(B) Mention one use for the following	(B)	Mention	one	use	for	the	fol	lowing	
---------------------------------------	-----	---------	-----	-----	-----	-----	-----	--------	--

Windmills:.

[(A) Put (✓) or (X):	s mark	(5.
Wind turbines must be used in windy places.	()
2. Solar panels can be used to operate irrigation equipment in some	villages. ()
3. Water condenses forming fuel, then return back to its source		,
during rainfall,	()
4. Dams are built on rivers to increase thermal energy of rivers' water	er. ()
(B) Give a reason for the following :		
You can feel warm at night although the Sun is not visible in the	skv.	

THEME FOUR: CHANGE AND STABILITY

4



SHIFTING SURFACES

Get Started

What I Already Know



- There are many forces such as water and wind that shape the rocks on Earth's surface.
 - Water and wind can break down rocks and move them from one place to another through two processes known as "weathering" and "erosion".
- The opposite image shows a large canyon known as Wadi Nakhr in the country of Oman.
 - In Wadi Nakhr, water, wind and other factors
 cause the different landforms there such as high
 peaks and also the cracks in the large rocks.



- How weathering and erosion shape the Earth's surface.
- The role of the following factors in weathering process:
- Water.

- Wind
- Plant roots.
- Acid rain.
- Oxygen gas in air.
- How deposition process helps in the formation of different landscapes on the Earth's surface.

· Unit Project :

"Forces that shape the Earth" At the end of this unit, you will make a research project to predict what factors (such as erosion, weathering, ... etc.) have an important role in shaping the different landforms of Wadi Nakhr over time.



Wadi Nakhr



Weathering of rocks

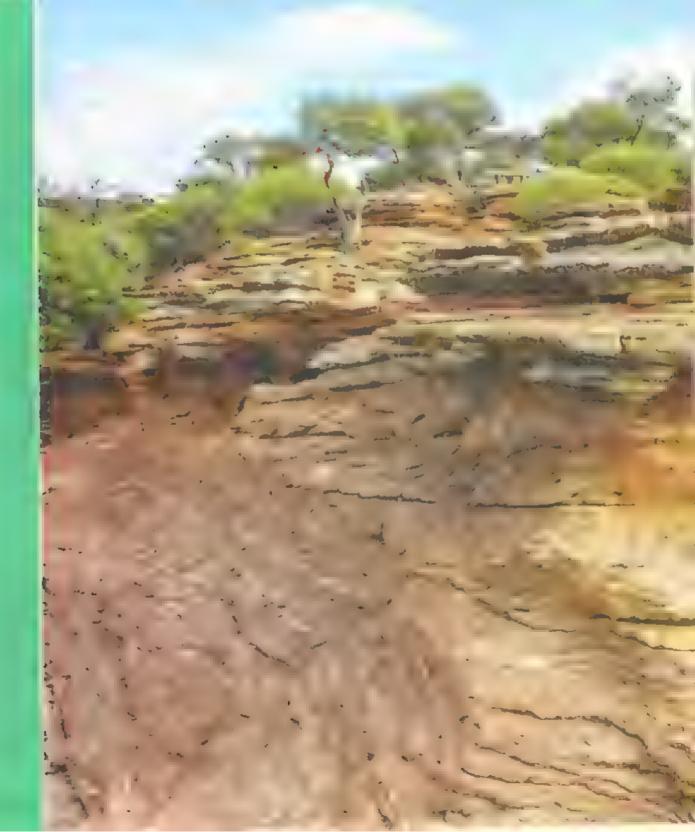


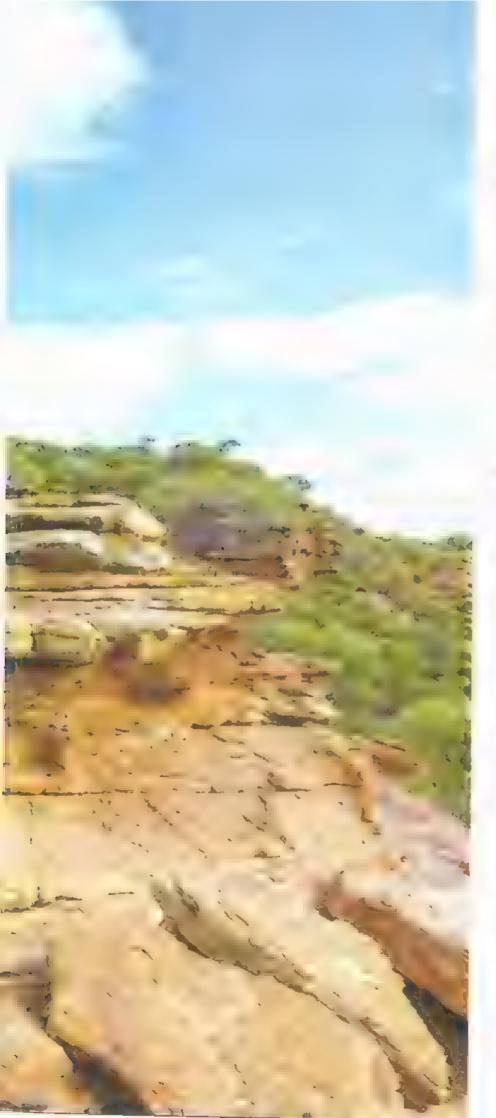
Wadi Nakhr



4.1

Breaking Down and Moving Rocks





Learning outcomes

By the end of this concept, your child will be able to:

- Explain the roles of water, wind and heat in weathering, erosion and deposition.
- Provide evidence that mechanical and chemical weathering change Earth's surface over time.

Key vocabulary

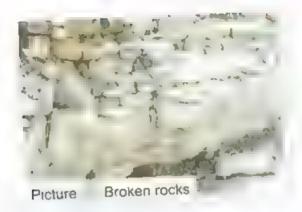
- Air
- Chemical weathering
- Deposition
- Erosion
- Heat
- Mechanical weathering
- Sediment
- Soil
- Water
- Weathering

Manual For Promotor to Comments.

Lessons	Activities	What you should do with your child
	Activity 1	Explain to your child how Earth's surface changes from time to time
1	Activity 2	Discuss with your child how erosion affects coasts
	Activity 3	Explain to your child how canyons are formed.
	Activity 4	Discuss with your child the three main processes through which the Earth's surface changes
2	Activity 5	Discuss with your child the difference between weather and weathering
	Activity 6	Explain to your child the types of weathering.
2	Activity 7	Let your child observe models for different types of weathering
3	Activity 8	Let your child observe some photos that shows weathering
	Activity 9	Explain to your child how erosion occurs.
4	Activity 10	Explain to your child how deposition changes the shape of the land
	Activity 11	Discuss with your child how sand dunes are formed.
5	Activity 12	Heip your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation.

LESS MOMENTS







The pictures above show some changes in the Earth's surface

▶ What are the factors changing the Earth's surface ?

 The surface of the Earth is always changing due to the effect of the wind, water and weather changes.

Examples:

- As you see in picture ___, wind can break down rocks and can move the small particles of rocks from an area to another.
- As you see in picture ___, water can change the shape of rocks.

In this concept, we will study:

- Changing Earth's surface.
- Rocks and canyons.
- Weathering.
- Types of weathering.
- Causes of weathering.
- Erosion.
- · Deposition.

factors break down landscape عوامل عوامل deposition تغدث particles

erosion قدوه weathering ترسیب

العرباة تجوية

127

Activity Disappearing Sand and

- ▶ Look at the opposite pictures, then put (√) or (x):
 - The footprints will still be there the next day. (



2. The shape of the sandcastle will still be there without changing till the next day.



Natural Erosion:

- If a child built a sandcastle on the beach (seashore), he may notice the disappearance of a part of it or all of it after few hours.
- Water and wind are some of the factors that can transport small rocks from one place to another forming a process known as "erosion".
- The disappearance of the sandcastle (erosion of the sandcastle) is due to the transportation of the sand particles from its place to another by the effect of water and this is considered as an example of natural erosion.

Notes

- 1. Sand is formed by breaking down of some types of rocks into smaller particles.
- 2. Forces of water and wind are responsible for the disappearance of sandcastles and erosion of coasts.





Check your understanding

▶ Put (√) or (X):

- 1. The erosion of a sandcastle on a beach is considered as a natural erosion.
- Rocks are formed by breaking down of sand.

Activity Sandcastles, Rocks and Canyons

▶ The Earth's surface is continuously changing. Some changes can be very fast, other changes can be very slow that may take hundreds or millions of years.

Fast changes

- They are observed in a sandcastle.
 - It may completely disappear in a few minutes as a result of its hitting by the sea waves.



S ow changes

- They are observed in coastal rocks over time.
- There may be some little difference in its shape after many years if some parts break off.



- In the previous pictures, we can observe some similarities between the sandcastle and coastal rocks:
 - 1. Both have steep needle-like parts.
 - 2. Both have sloping sides (inclined sides) at the bottom.
 - 3. Water and wind create their shapes.

Canyons:

They are deep valleys carved by flowing water.

- Canyons are formed due to the slow changes that happened to its rocks over many years.
- Canyons are formed by the action of water.
- A canyon has needle-like parts and slopes at the sides.





▶ Put (√) or (x):

1. The Earth's surface never change over time.

()

2. Wind and water can break down rocks into smaller particles.

In the Assessment Book
Try to answer.

Self-Assessment (13)

hitting inclined sides needle-like

جوادي مثالة break off slopes

waves صخور ساحلية valley تنفصل carved اتحدارات

أمواح وأدي محدولة

Exercises on Lasson 1

	● understand	O w Pality	Ø Higher Thinking Strits					
	hoose the correct answer							
1	. Sand is formed due to bre	aking down of	-71-					
	a glass. b wood.	c. rocks	d plastic.					
2	The deep narrow valley w	ith slopes at its si	des and often with water stream					
	flowing through it is know	n as a						
	a canyon. b moun	tain. c hill.	d river.					
3	. The formation of canyons		,Alex 2023	31				
	few minutes. few h							
4		n into small partic	les by the exposure to all of the (Aswan 202)	3				
	following, except	e moor	44					
	a rain water. b wind.	c moor						
5			the effect of sea waves means that					
	all the following have cha		e. d. its color.					
6			erosion, because it can					
	 The force of wind plays an important role in erosion, because it can transfer 							
	a sound energy.	b light	energy.					
	small sized-particles of	sand. very	large pieces of rocks.					
7	7 Among the changes which	h are happened v	ery fast, is					
	formation of deep cany		ppearance of a sandcastle.					
	breaking down of costs	it rocks. brea	king down of mountain rocks.					
I	ricife mi			. 7				
	(A)	_	(B)					
	1 Costal rocks.	a are formed by	the effect of sunlight directly.					
			eared in few minutes and made of					
	2. Canyons.		on seashores.					
	3 Sandcastle.		hat are carved by flowing of water.					
			ear seas over many years and have					
		needle-like pa	erts and sloping sides.					
			2					

3 Put (V) or (X):		
1. The surface of the Earth changes from time to time.	()
2. Water stream can break down rocks into smaller pieces.	()
When large particles of rocks are broken into smaller particles, they carried by the moving wind.	can be	· .
	()
 If you walk on the seashore and come the next day searching for yo footprints, you will find them unchanged. 	ur (}
5. All changes that occur on the Earth' surface take hundreds of years.	()
Water and wind are artificial forces that are responsible for the erosion of sea coasts.	(,
	()
7. The changes that are observed in the formation of a canyon are fast than that observed in the disappearance of a sandcastle.	er ()
Of the same of the	,	
The disappearance of a sandcastle as a result of its hitting with the sea waves.		
2. They are deep valleys carved by flowing water.	(.)
Rocks that are found near seashores and broken by the effect of win	()
and water over long periods of time.		
15	(.)
(slow - erosion - fast - rocks - wind - water)		
The shape of coastal rocks is affected by the forces of and	wind.	
	Acx 2.	
2. The origin of sand is the breaking down of some types of		
Air moving from an area to another and has a role in breaking down of into smaller particles is known as	of rocks	
The process of transporting small rocks from one place to another by of water or wind is known as		
5. Disappearance of a sandagations as a second	Behira 202	3
formation of a canyon is an example of changes, v	vhile	
Give a reason for the following:		
Formation of canyons is considered as an example of slow changes.		

¹³¹

What happens if ...?

Sea waves hit costal rocks over a long period of time.



Figure (1)



Figure (2,

- 1. The force of water forms
- a figure (1) only. figures (1) and (2).
- b figure (2) only. neither figure (1) nor (2).
- 2. Water that affects the item in figure (1) is considered as an example of
 - human-made changes.
 - c fast changes.

- artifical changes.
- d slow changes.

LESSON TWO

Activity 🛄

What Do You Already Know About Breaking Down and Moving Rocks I

▶ Put (√) or (x):

- Erosion happens when the rocks get moved away by water or wind.
- 2. Sometimes erosion can happen very quickly. (

Shaping the Earth:

In this activity, we are going to understand some processes through which the Earth's surface changes, these processes include weathering, erosion and deposition that can be shown in the following figure.



- From the previous figure we can observe that .
 - Area shows the breaking down of large rocks into small particles (sediments), this process is known as "weathering".
 - Area shows the movement of sediments from one place to another, this
 process is known as "erosion".
 - Area shows the dropping of sediments in a new place, this process is known as "deposition".

Note

Sediments could be sand, rocks or soil, and this depends on the environment in which the weathering process takes place.



Check your understanding

- Complete the following sentences:
 - 1. The process that is laying sediments down in a new place called
 - 2. The process in which rocks are broken down into smaller particles is known as

dropping

sediments إسقاط

takes place

Activity What is Weathering?

Weather and weathering:

Weather is different from weathering, where :

Weather	Weathering
It is the condition of atmosphere at a specific time and place.	It is the breaking down of rocks on Earth's surface into smaller (tiny) pieces.
There are many factors affecting weather such as temperature, wind, rains, ect.	There are many factors that cause weathering such as temperature, wind and water.
 The condition of weather can help us to decide what to wear when we go outside. 	Weathering can change the shape of Earth's surface over time.

You can see the effect of weathering in many observations around you such as :

Breaking of statues.

Removing of paints of buildings.

Pulling a wave to the sand of seashores.







Colder climate and ice are other factors that can change the landscape.



Check your under

▶ Put (√) or (X):

- 1. Weather is the breaking down of rocks on Earth's surface into smaller pieces.
- 2. Weathering process affects the coastal areas.

Activity Types of Weathering

► There are two types of weathering which are "Mechanical weathering" and "Chemical weathering".

A. Mechanical weathering:

It is the breaking down of rocks due to the effect of physical factors like wind, water, plant roots and temperature.

1. The role of wind in mechanical weathering :

Wind pushes the sand from a place to another,

Friction occurs between sand and rocks.

Rocks are broken down.



2. The role of water in mechanical weathering:

Flowing water that carries small gravel and sand runs quickly and collide with large rocks.

<--- The second of the second

Large rocks are broken down and its rough edges become smooth.



3. The role of plant roots in mechanical weathering :

Plant roots grow inside the cracks of rocks.



Cracks become wider.

Rocks are broken down



4 The role of temperature in mechanical weathering:

Water flows into the tiny cracks of rocks.

When the temperature gets very cold, water freezes forming ice that expands and makes the cracks of rocks become wider.

When the temperature increases, the ice melts, so water fills newly formed wide cracks again.

The cycle of freezing of water and melting of ice continues until rocks are broken down.



B. Chemical weathering:

It is the change of the structure of rocks due to chemical reactions.

Chemical weathering happens due to the chemical reactions of rocks with some other materials such as :

1. Oxygen.

2. Water.

3. Acid rain.

4. Acid produced by some living organisms.

The role of oxygen in chemical weathering :

Oxygen of air reacts with iron of some rocks forming red-colored rust, this reaction can weaken rocks and break them down easily.



Red colored rust in rocks

freeze expands flow produce تنجمد reaction دوق

melting ينتج weaken تفاعل fill أسطار حمضية pebbles نوبان periods يضعف rust

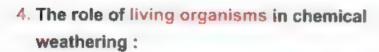
حصی فدرات صدأ

2. The role of water in chemical weathering:

When water dissolves minerals in a rock, the dissolved minerals combine again forming new shapes as in limestone caves.



When the acid rain fall on rocks, it can dissolve minerals found in these rocks, causing the break down of rocks.



Some tiny organism called "Lichens" produce acids on rocks that dissolve minerals found in these rocks and break them down.

Notes

- 1. Lichens is tiny plant-like organisms.
- 2. Weathering happens over long periods of time.
- 3. It is hard to see weathering during its occurrence, but you can see its effects all around you in the little rocks, pebbles and sand that were parts of much larger rocks.





Acid rains



Lichens on rocks



Check your understanding

▶ Complete the following sentences using the words below:

(acids - oxygen - mechanical - chemical)

- Types of weathering can be classified into mechanical weathering and weathering.
- Freezing of water inside cracks of rocks may cause a type of weathering known as _____ weathering.
- Chemical reaction between iron and causes its rusting.
- Lichens produce that may cause breaking down of rocks.

Exercises on Lesson 2

● Understand O Approx ● Higher Thirdking Skills	
Choose the correct answer	
The condition of atmosphere including temperature, wind and rains is known as weather. weathering erosion deposition.	
2. The dropping of sediments in a new place, is known as	
weathering, deposition freezing, erosion.	
 3. Limestone caves are formed due to the combination of a dissolved minerals. b red-colored rusts. c living organisms. d acid rains. 	
4. Lichens produce on rocks that dissolve minerals found in the	ese rocks.
a oxygen b acids c water d rain	
5. Rusting of a statue is an example of the action of process. a deposition b erosion mechanical weathering chemical weathering	
6. Breaking of statues is an example of	
erosion. weathering. deposition. sedimentation	n.
7. All the following are processes that can change the Earth's surface, e	xcept (Cairo 2023
digestion. erosion. weathering. deposition.	
8. When water freezes, it expands. This means that	
it will evaporates. Its temperature increases.	
its volume increases its volume decreases	
9. All the following are from causes of chemical weathering, except a. oxygen, b. water, c. acid rains, d. clouds.	
10. Water can produce that affect(s) the shape of the Earth. a mechanical weathering only b chemical weathering only c both mechanical and chemical weathering neither mechanical nor chemical weathering	
Put (v') or (x): 1. Wind can be considered one of the factors that cause weathering.	()
2. Plant roots help in the formation of rocks.	()

	3	Limestone caves are formed by the action of mechanical weathering.			()
		Friction force between rocks and sand carned by wind may cause weathering.				\
	5	. When iron in rocks rusts, the rock becomes more stronger,			/)
		There are many types of sediments like sand, rocks and soil			,)
		The movement of sediments from one place to another is known as weathering.			()
	8	. Shaping the Earth is usualy starts by deposition process.				,
		All physical factors of mechanical weathering lead to breaking down or rocks.	ıf)
	10	Oxygen in air reacts with iron of some rocks forming green-colored rus	st.	1	()
Ej						
	1.	. A process in which rocks are broken down into smaller particles.	(,)
	2.	. A process in which small broken rocks move from a place to another by the help of wind or water.			? /	
	3.	A process in which the sediments are dropped in a new location by the action of wind, water and gravity.	(1
	4.	. A part of plant grows inside cracks of rocks causing its weathering.	· ·		•	1
		. The condition of atmosphere at a specific time and place.	(1
٦		It is a type of weathering through which acids of lichens dissolve minerals of rocks. **Qalyoubia 2023**	()
	7.	It is a type of caves that is formed when dissolved minerals of rocks	,		4 #+- 1	
	8.	It is a process through which water forming ice in cracks of rocks.		1	1 711	(
		A gas in air combines with iron of some rocks and causes its weakness				,
		Dakahia 2023				V
			K) P- #4 E	h- m.	,
	1.	During process, rocks are broken down or weared away.				
	2	There are two types of weathering which are weathering and				
		weathering.				
	3.	The type of weathering in which the rocks are broken down due to plar known as weathering	nt n	001	ts is	š
•	4.	The type of weathering in which the structure of rocks changes due to reactions is known as weathering.	ch	em	ical	

5. Some tiny plant-like organisms produce rocks causing its breaking down.	that can dissolve minerals of
Shaping the Earth started by weathering, then deposition.	and ends with
7. Breaking a statue is an example of mechanical iron statue is an example of weather	
Lichens produce acids on rocks that dissolves	sits
Mechanical weathering takes place when carried by wind and rocks.	occurs between sand
10. Flowing water which carries small gravel and weathering.	sand may break down large
5 Give reasons for :	
1. Iron in rocks may rust.	(Cairo 2023)
2 Water play an important role in the formation of	of limestone caves.
What happens if?	
 1. Lichens growing on rocks produce acids. 	
2. A red-colored rust is formed on some rocks.	
11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	t ret
example of chemical weathering :	to the transfer of the continued of
 Breaking down of rocks by the effect of sand w 	
2 Rusting of iron in rocks due to the reaction be	
3. Breaking down of rocks by the effect of acids	produced by Lichens. ()
 Breaking down of rocks by the effect of freezi ice inside their cracks. 	(
Breaking down of rocks by the effect of growt of rocks.	h of plant roots inside the cracks
Breaking down of rocks by the effect of small carried by flowing water.	gravel and sand which are

look at the following putures, then put (+) or (x)







Limestone caves Picture (B)

1. Picture (A) is	s an example of mechanical we	athering.	()
2 Picture (B) is	s formed when water dissolves	minerals in a rock.	()
Picture (A) is Lichens.	s formed by the effect of acids v	which are produced from	()
4. The type of weathering v	weathering which forms picture which forms picture (A).	(B) is the same type of	()

SESON THREE

Activity 1

Modeling Mechanical and Chemical Weathering

▶ Put (√) or (x):

- 1. Water plays an important role in both mechanical and chemical weathering. (
- 2. The chemical weathering can change the color of rocks
- · Weathering of rocks is a slow natural process that often takes many years to see its effect.
- In this activity we will model and explore both mechanical and chemical weathering to understand the similarities and differences between them.

▶ Tools



Biscuits (crackers)



Piece of cloth



Antacid tablet in a cup of water

Steps

1. Crush some biscuits inside the piece of cloth with your hands for few seconds.



Put some other biscuits in a cup of water contains antacid (Antacid is a medicine used to treat the high acidity of stomach).



Observations

- 1. In the first step, biscuits are broken down into smaller parts, but they still look like biscuits.
- 2. In the second step, biscuits dissolve and mix with water containing antacid causing a formation of different material

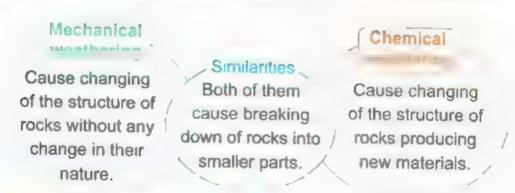
Conclusions

- In the mechanical weathering, the substance is broken into smaller parts without changing its nature.
- In the chemical weathering, the substance is broken into smaller parts and another substance is formed as a result of chemical reactions
- Chemical weathering causes greater changes to substances than that happen in mechanical weathering.



Scientists use models to recreate the weathering process to understand it better, because weathering takes a long time in real life, and the rocks we can see now have been weathered over hundreds of years.

So, we can summarize the previous conclusion in the following figure :





Check your understanding

▶ Choose the correct answer:

 The chemical weathering makes weathering.

2. Occurrence of weathering takes

changes than the mechanical (weak - great - little)

in real life.

some hours - few days - hundreds of years)

result

conclusion تبجة

recreate



Activity Menthering

- We have learned in the previous lesson that, there are two types of weathering which are mechanical weathering and chemical weathering
- Now, we are going to deduce if this landform shown below is affected by mechanical weathering or chemical weathering.



- You will notice from the previous picture that rocks are broken into smaller pieces with different shapes of the same material.
- This process is similar to that happened to biscuits broken by hands in the previous activity, this leads us to conclude that the landform shown above has been mechanically weathered over time.



▶ Put (√) or (x):

 In both mechanical weathering and chemical weathering, the substance 	e is
broken down into smaller parts.	(

2. A new substance is formed if mechanical weathering occurs.	()
---	---	---

3. In mechanical weathering the rocks are broken into smaller pieces wit	h	
different shapes and new materials.	()

In the Assessment Book : Try to answer * Self-Assessment (15)

كاريس lead يستنع lead يستنع lead يستنع

Exercises on Lesson 3

 Understand 	O Apply	• Higher Thinking Skills	
Choose the correct answer	er:		
1. The breaking of rocks in	to smaller particle	es without changing their p	properties is
called ,			(Assiut 2023)
mechanical weathering	ng. t che	emical weathering.	
c deposition.	d. ero		
2. Which of the following d	oes not cause me	echanical weathering?	
a. Roots of plants.	b. Aci	d rains.	
Wind movement.		ter movement.	9/1 2 2
The breakdown of rocks	either mechanica	ally or chemically is called	
rusting. twea		position. 1 erosion.	
 Crushing a piece of bisc 		milar to of rocks	
mechanical weathering	ng b che	emical weathering	
c. erosion	d. der	position	
Put (v') or (x):			
1. Roots of plants can slow	/ly grow over time	through small cracks in n	ocks
causing chemical weath	ering.	and	()
 2. When water freezes, its 	volume increases	3.	- ()
Reaction between oxygen	en with the iron of	some rocks causes its ch	emical
weathering.			()
4. Grinding of biscuits by h	ands into fine pov	vder has the same effect of	of
mechanical weathering	of rocks.		()
√ Te the scent file term of	of each of the foli	owing	
1. A process in which a larg	e rock is broken i	nto small pieces. M	()
A process that takes pla	ce in rocks and ca	an be explained by pressing	ng '
strongly on cubes of sug	ar until it become	es a powder.	()
3. A process in which the c	olors of paints of	houses are changed as	
a result of falling of acid			(,)
Complete the following se			
 The cracks caused by free weathering. 	eezing of water a	nd melting of ice represen-	t
^c 2. In the weatheri	ng, the chemical	structure of rocks doesn't	change
Putting some biscuits in weathering of rocks.	a cup of water tha	at contains antacid is like t	he
* 4. Formation of limestone of	aves is an examr	le of wastbasins	

LESSON FOUN

Activity 1

▶ Put (√) or (x):

- 1. Earth surface is reshaped through some processes like weathering, erosion and deposition.
- 2. After breaking down of rocks into smaller particles, they never move from a place to another.
- We have learned in the previous lessons that the large rocks are broken down into smaller particles during weathering process.
- Once the rock has been broken, it is ready for erosion.

Erosion:

It is the process in which the small particles (sediments) of sand, soil and rocks are moved to other places by wind, water and gravity.

Action of wind erosion

A gentle wind may carry sand grains for a short distance (about 1 meter), while stronger wind and hurricanes carry them for a longer distance.



Action of water erosion

- Rivers and floods carry sand, soil and rocks downstream
- Sea waves pull sand away from beaches.
- · Rain washes away the soil of farms that locate beside downhill.



Action of gravity erosion

The broken weathered rocks in a mountain can be pulled down at mountainsides by the effect of gravity.



VNotes

- 1. Sediments are small solid materials such as sand, soil and small particles of rocks.
- 2. Sediments are moved by wind and water and settles on the surface of land or the bottom of water bodies such as lakes and seas.
- 3. You can see the evidence left by erosion after hundreds, thousands or millions of years from its occurrence.

- don		
N. A.	hook	1
	heck your understanding	i

▶ Put (√) or (x):

1.	Floods are one of the factors that cause water erosion.	()
2.	Gravity does not affect the small rocks that have been broken down	·	,
	from mountains.	()
3.	A strong wind may carry sand grains for a short distance.	ì)
4.	Among the types of sediments are sand and soil.	()
		4	-



Activity 10 Deposition

- We have learned from the previous lessons how rocks can be broken into smaller pieces through weathering process, and these small pieces are carried away through erosion process.
 - After erosion, the deposition process is the next stage that shows where these pieces of rocks might end up.
 - When the wind blows, it picks up sand into the air.
 - As the wind moves, the sand may travel with it to a new place
 - When the wind stops blowing, the sand falls onto the ground and deposites.

Deposition:

It is the process of laying down of sediments after its erosion.

 Now, let's see some examples that show how deposition process affects the shape of land.

Action of water in deposition:

- Running water in rivers play an important role in deposition process such as :
- A river can deposite a sandbar along its banks (sides).
- When a river carries sediments meet a sea, these sediments are deposited there forming a delta such as the Nile Delta.



The Nile Delta

Delta:

It is a fan-shaped (triangle-shaped) mass of mud and other sediments that forms where a river enters a large body of water.

 Sea waves also move sand from one place to another new place where it deposites there.

Action of wind deposition:

- Weak and strong winds play an important role in deposition process such as :

Weak winds	Strong winds
- They can form small sand dunes.	- They can form large sand dunes.
Example:	Examples:
 Sand dunes on a beach. 	Sand dunes In :
	- Western Desert in Egypt.
	- Rub' Al Khali in the Arabian Peninsula.
Winds of the same	



Check your understanding

▶ Choose from column (8) what suits it in column (A):

(A) Deposition factors	(B) Its effect
1. Wind in the desert.	a. Formation of a delta.
2. A river meets the sea.	b. Formation of sand dunes.

In the Assessment Book:

Try to answer: Self-Assessment (16)

Exercises on Lesson 1

Understand O Agricky O Higher Thinking Skills Choose the correct answer: Moving of sediments from a place to another represents process. weathering photosynthesis erosion deposition distance, but the hurricanes can 2. A gentle wind may carry sand for a carry sand for a distance. long - shorter long - longer short - shorter short - longer 3. A is formed where rivers meet a sea. b mountain c volcano d canynon a delta 4. Which of the following arrangements is correct about reshaping Earth's surface? ... a Erosion —→ Weathering —→ Deposition. b Erosion — ➤ Deposition — ➤ Weathering. ○ Deposition — ➤ Erosion — ➤ Weathering. d Weathering → Erosion → Deposition. 5. Each of the following plays a role in erosion process, except b water floods. a blowing wind. d Earth's gravity. (Qena 2023) c sunlight for a short distance. Gentle wind can carry b sand grains a large rock d. a big mass of mud c a large body of water 7. Pulling sand away from beaches by sea waves, is considered as an example of chemical weathering. mechanical weathering. d. deposition. c erosion. 8. Pulling down broken weathered rocks at mountainsides occurs by the effect of b freezing of water. a gentle wind. d chemical weathering. c Earth's gravity. is formed. 9. When a river that carries sediments meet a sea, a triangle-shaped delta a large mountain

d. a large sand dune

c a small sand dune

[.	, P	ut (/) or (x):		
	1.	The effect of erosion may last for hundreds of years. ()	
ø	2.	Sea waves may cause erosion of beaches. ()	
	3	Gravity pulls rocks down the mountainsides causing its erosion. ()	
	4.	Deposition process never change the shape of the land. ()	
	5.	Sediments are usually liquid materials that settle on the surface of land. ()	
	6.	Strong wind and hurricanes carry sand grains for a short distance. ()	
	7.	Blowing of wind and flooding of water play an important role in erosion process.	1	
	8.	Nile delta is a triangle-shaped mass of mud and other sediments. (í	
		Carro Zr.	,	
	9.	Gentle winds can form large sand dunes like that in Egyptian western desert.)	
	1,	It is the process by which natural forces move weathered rocks and soil from one place to another.)	
	2.	It is the process in which weathered rocks and soil are layed down or dropped		
	3		_	
		A fan-shaped (triangular) mass of sediment that is formed where a river enters a larger body of water like seas.)	
		A hill of sand created by the wind.)	
	5.	They are small solid materials such as sand, soil and small rocks that carried		
	e	by water to another place.)	
	0.	The force that pulls down broken weathered rocks at mountainsides. ()	
	C	omplete the following sentences:		
ı	1.	Wind, and gravity are natural factors that control erosion process.		
	2.	Sand grains fall on the ground when the carrying it stops.		
ŀ	3.	Sediments are moved by the effect of and then settles on the surface of land or the bottom of water.		
	4.	Blowing of strong in the desert may form large sand dunes.		
		trong wind and hurricanes carry for a long distance.		
١	6.	Gentle winds can form small like that present at sea beaches.		

Give reasons for :

- 1. Formation of a delta when a river meets a sea.
- 2. Formation of small sand dunes on a beach.
- 3 Formation of large sand dunes at Western Desert in Egypt.
- 6 What happens when ...?

A river carries sediments meet a sea.



- 1. Sand dunes in picture number
- 2. Sand dunes in picture number
- are formed by strong winds. are formed by weak winds.

LESSON FIVE

Activity III Inidence of Change

- ▶ Put (√) or (x):
 - 1. The erosion process happens very slow.
 - 2. The deposition process happens without erosion.
- From the previous lessons, we have learned that :
 - The surface of the Earth is continuously changing from time to time.
 - There are three processes that have an important role in changing the Earth's surface, which are weather ng, eros on and depos ton
- Now, we will study how these processes happen in order

Weathering: It is caused when wind or water wears down rocks or the shape of landform is changed by mechanical or chemical processes.



Erosion: It is caused when wind or water moves materials from one place to another.



Deposition: It occurs when eroded materials stop moving and settle on a surface, often forming layers over time.



- By the action of the three previous processes we can observe changes in the Earth's Surface such as .
 - · Sand dunes which are small hills of sand found in a desert or on top of a beach.



 Delta which is a piece of land shaped like a triangle that is formed when a river enters a large body of water such as a sea or an ocean.



The Nile Delta



Erosion and deposition are linked processes, erosion does not occur in one place without deposition in another, and vice versa.



Check your understanding

- ▶ Complete the following sentences using the words below : (erosion – weathering – deposition)
 - The process in which rocks are broken down to form sediments is called
 - The process in which the eroded rocks stop moving and settle on a surface is called
 - 3. The process in which sediments are transported by water or wind from a place to another is called

Activity Record Evidence Like A Scientist

- In this concept, you have learned a lot about wearing down and moving rocks
- Now, try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in the previous concepts.

1 The Question

How do wind, water and weather change Earth's surface ?







Review on Concept (4.1)

To review this concept look at the Assessment Book "Part 2: Final Revision".

In the Assessment Book:

Try to answer

- Self-Assessment (17)
- Model Exam on Concept (4.1)

Exercises on Lesson 6

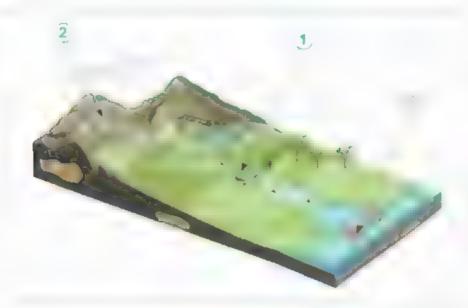
Migher Thinking Skills

OAsply

Understand

	Cl	hoose the correct answer:					
	1.	As a result of breaking down of		, sand is formed.			
		a rubber	b	plastic			
		c. rocks		glass			
	2	Conditions of atmosphere including	g te	emperature, wind and rains a	re know	/n	
		as					
		a weather.	b	weathering.			
		c. deposition.	đ	erosion.			
	3	The breakdown of rocks either me	cha	anically or chemically is know	n as		
		a photosynthesis.	b	weathering.			
		c erosion.	d	deposition.			
	4.	When a river meets a sea or an oc			1.000		
		a. canyon	b	volcano			
		c mountain	d	delta			
e	P	ut (✓) or (X):					
Т	1.	The surface of the Earth never cha	anç	ges.		())
	2	Limestone caves are formed as a	res	sult of chemical weathering.		()
	3.	The volume of water decreases w	he	n it freezes.		()
'n	ı		4	i vi			
7	1	They are deep valleys carved by f	lov	ving water.	()
	2	. A process in which small broken re	ocl	s move from a place by the l	relp		
		of wind or water.			()
	3	. A process in which the moving sec	lim	ents are dropped in a new pla	ce. ()
5	١.	· (pain(, . a) no .					
t.	4	. The origin of sand is the breaking	do	wn of some types of	7		
	2	. The type of weathering in which the	he	rocks are broken down due to	o the pre	esence	þ
Ī	-	of plant roots is known as	. 1	weathering.			
	3	. The cracks caused by heating an	d c	ooling of water represent a ty	pe of		
		weathering known as W	ea	thering.			
P	4	. When strong blow in the	e d	esert, large sand dunes are f	ormed.	dia 2021	21
1		_			(isma)	ilia 2 023	"

Cook at the following figure, then choose the correct answer.



- 1. Arrow number indicates the occurrence of weathering process of mountain rocks by the effect of rain. (1-2-3)
- 2. Arrow number indicates the occurrence of erosion process to the small rocks at the sides of the river. (1-2-3)
- 3. Arrow number indicates the delta which is formed by the effect of process. (weathering erosion deposition)







(.....)

	ou concehi f.	,		
			(5 mai	'KS
The formation of canyons takes				
few minutes few hours.	few days	man	y years.	
2. Which of the following does not cause	e mechanical weatheri	ng ?		
a Roots of plants.	b Acid rains.			
c. Wind movement.	d Water moveme	ent.		
3. Moving of sediments from a place to	another represents	proces	SS.	
weathering photosynthesi	is erosion	depo	osition	
4 When a river meets a sea or an ocea a canyon b volcano	an, a is formed	d. delta	9	
(B) Give a reason for the following: Iron in rocks may rust.				
(A) Put (✓) or (X): 1. Sea waves may cause erosion of be	aches		(5 me.	rks
2 The surface of Earth changes from the			(
3. All physical factors of mechanical we		king down	of	
rocks.	attoring load to brown	9	(
When water freezes, its volume decre	reases.		(
(B) What happens if?	acids		(
Lichens growing on rocks produce	acius		Ì	
T .	ę ·		(5 <i>m</i> c	31 k
1. A process in which small broken roo	ks move from a place	to anothe	r by the	
help of wind or water.			(****
2. A process in which the colors of pair	nts of houses are char	nged as		

a result of falling of acid rains.

- They are deep valleys covered by flowing water.
 ()



Figure (1)



Figure (2)

- 1. The force of water forms
 - a figure (1) only. figure (1) and (2).

- b figure (2) only. neither figure (1) nor (2).
- Water that affects the item in figure (1) is considered as an example of human-made changes.

 artifical changes.
- c fast changes.

d. slow changes.





			VIII	Gondob	• (• • •)		
(A) C	noose the cor	rect answer:				(5 mar	ks)
1. Sai	nd is formed d	ue to breaking do	own of				
a ç	lass.	b. wood.	С	rocks.	d plastic	•	
2. Wr	ich of the follo	wing does not ca	use mecl	nanical weat	hering?		
a f	Roots of plants	;,	b	Acid rains.			
c l	Vind moveme	nt.	d	Water mov	ement.		
3. Lin	estone caves	are formed due	to the co	mbination of	F		
а	dissolved mine	erals	b	red-colored	i rusts		
c I	iving organism	ıs	d	acid rains			
4. Ea	ch of the follow	ving plays a role	in erosio	n process, e	except		
a	olowing wind.		b	water flood	is.		
0.5	sunlight.		d	Earth's gra	wity.		
(B) G	ve a reason fo	or the following:					
F	ormation of ca	nyons is conside	red as ar	example of	f slow changes.		
(A) P	ut (🗸) or (X) :					(5 mai	rks)
1. All	changes that	occur on the Earl	th's surfa	ice take hun	dreds of years.	()
2. Th	ere are many	types of sedimen	its like sa	nd, rocks ar	nd soil.	()
3. Ro	ots of plants o	an slowly grow o	ver time	through sma	all cracks in rock	s causi	ing
	emical weathe					()
4. Wa	ater can cause	the two types of	weatheri	ing.		()
(B) W	hat happens i	f ?					
A	river carries s	ediments meet a	sea.			()
(A) (omplete the i	ollowing senten	ces:				
1. Br	eaking a statu	e is an example	of mecha	anical weath	ering, while rusti	ng of a	n
iro	n statue is an	example of	wea	athering.			
		on the ground wi		car	rying it stops blo	wing.	

2. Sand grains fall on the ground when the

- When strong wind blow in the desort, large sand may be formed.
- Cracks caused by freezing of water and melting of ice represent weathering.
- (B) Study the following pictures of sand dunes, then complete the sentences below:



Picture (1)

- 1. Sand dunes in picture number
- 2. Sand dunes in picture number



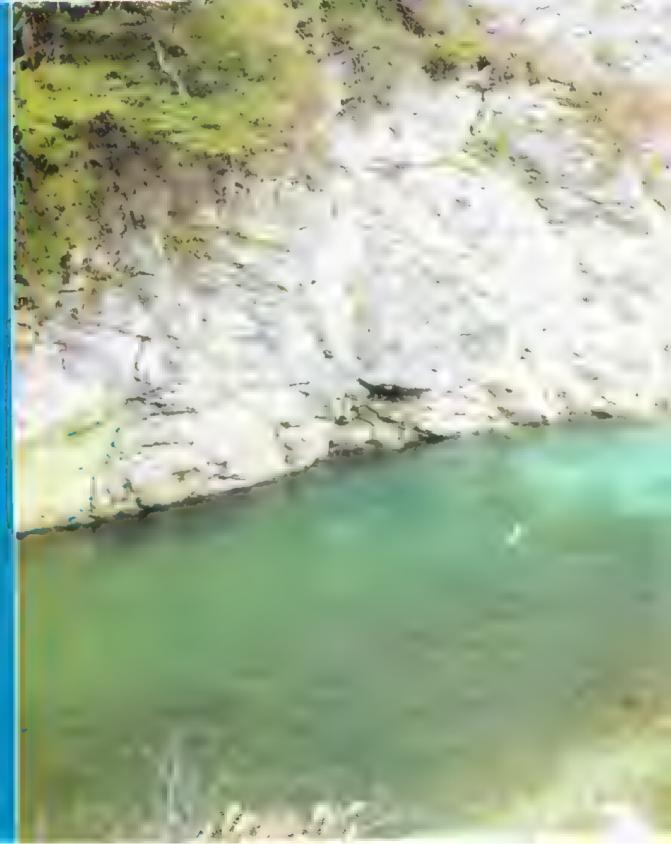
Picture (2)

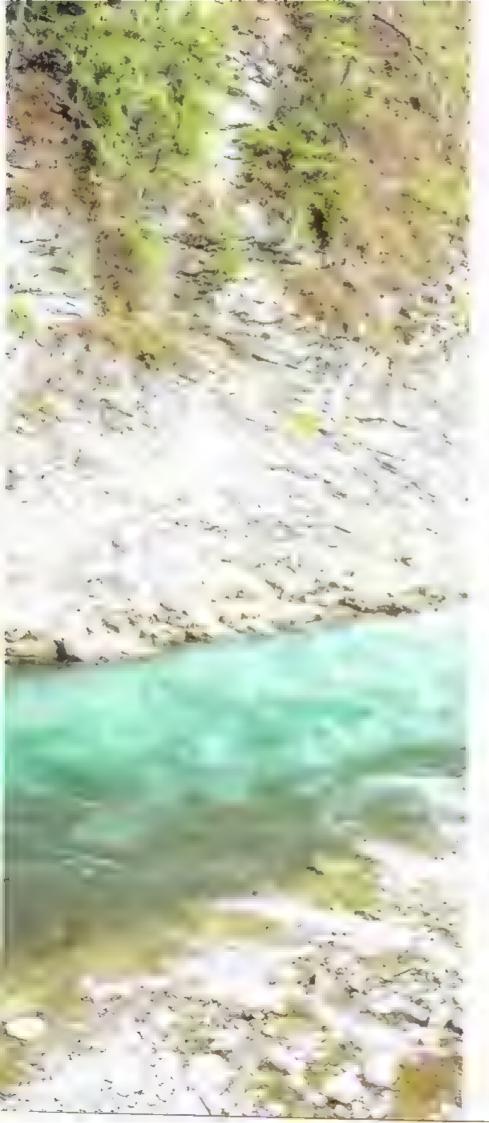
are formed by strong winds. are formed by weak winds.



4.2

Changing Landscapes





Learning outcomes

By the end of this concept, your child will be able to:

- Ask questions about the formation and stability of landforms that change slowly and quickly.
- Provide evidence that weathering and erosion by wind and water cause changes on Earth's surface over time.
- Develop a model that describes patterns in the formation of deltas and predicts where deltas are likely to form.
- Describe the interactions between water and landforms in a watershed and between wind and sand dunes at the beach.
- Use evidence from patterns in rock formations to explain the changes in Earth's surface over time.

Key vocabulary

- Canyons
- Dune
- Delta
- Valleys

Notes For Parents On Consept (- J

Lessons	Activities	What you should do with your child
	Activity 1	Explain to your child how canyons are formed.
1	Activity 2	Discuss with your child how carryons differ in shape and colors.
	Activity 3	Explain to your child an example about understanding the formation of landforms can help predict future change.
0	Activity 4	Discuss with your child the different changes which may occur in the school landscape, and their similarities with large landscapes
2	Activity 5	Discuss with your child the formation of canyon.
2	Activity 6	Explain to your child the similarities and differences between canyons and valleys.
3	Activity 7	Discuss with your child the formation of deltas.
_	Activity 8	Explain to your child the erosion by wind and formation of sand dunes.
4	Activity 9	Discuss with your child how wind can move sand and may be form dunes
5	Activity 10	Let your child think about how we can describe landforms

LESSON ONE

Activity 11 Can Von Liplain





You have learned in the previous concept that many factors can change and break down Earth's surface such as weathering, erosion and deposition and they form many landforms as canyons.

As you have learned, canyons as shown in pictures above are deep valleys carved by flowing water.

How are canyons formed?

- A canyon can be formed in many ways, such as weathering and erosion due to wind, water and other factors.
- Canyons can take millions of years to be formed.

In this concept, we will study:

- How landscapes change.
- Canyon formation.
- Canyons and valleys.
- Delta formation.
- Wind erosion.
- Rock layers of Wadi Al-Hitan.



▶ Look at the opposite picture, then put (√) or (x):

- 1. The flow of water on the sand can change its shape.
- 2. The sand particles remain in there positions when the water flows over them.



- When the water is moving over the sand, it pushes some of the sand out of the way.
- As the water moves the sand, it leaves an impression where the water flowed.
- This is the same idea of canyons formation.
- Canyons are formed due to erosion by water for a long period of time, as water can wear away landscapes and move sediments.

Canyons differ in their colors, texture and shape of rocks, where:

- Wadi Nakhr canyon in Oman, its color is brown and black but the Small Canyon in Thailand has a reddish color.





- Canyons can have V-shape as in colored canyons in Sinai and Wadi Rum canyon in Jordan.







Check your understands

▶ Put (√) or (x):

- Canyons are formed due to long term erosion.
- Wadi Nakhr canyon in Oman has V-shape.

Impression push 166 wear away

Jordan آتر gavy tendure flow يسبب الأكل

الأودن Thailand reddish color منمس nemain بتدفق

محمر النون

Activity 3

Minute Delivinia Rhamada Menagar Absort Changing Landscapes 1

Understanding the formation of landforms help predict future changes:

Example:

Canyon formation:

- The opposite picture shows a small canyon at the beginning of its formation by the effect of a stream of water, which can be observed from the following evidence:
 - Trees and other plants that are growing on both sides of the canyon, need water to grow.
 - The sides are gently sloped due to the help of water in wearing (eroding) the sides down.



Smail canyon

From the previous example we can predict that :

- Water streams that flow over flat land will probably form small canyons.
- The small canyon shown above could get deeper if it rained a lot, and water ran through it again.
- Beside canyons, there are many other forms of landforms such as :



Mountain



Dunes



Valley



Check your understanding

- ▶ Complete the following sentences
 - 1. The canyon is formed by the effect of
 - 2. The sides of are gently sloped.

In the Assessment Book

Try to answer Self-Assessment (18)

Exercises on Lesson 1

O ARGAM Higher Thinking Skills Understand Choose the correct answer: 1. A canyon may be formed due to the effect of (Giza 2023) a. erosion and deposition. b. weathering and erosion. d deposition only. c weathering and deposition. 2. A canyon can be formed by the effect of a. plants. b. animals. d. sunlight. c. water. 3. A canyon may take of years to be formed. (Suez 2023) d. couple a. hundreds b. tens c. millions 4. If the rain falls over a small canyon for several times per year, b. its depth decreases. a. its depth increases. d. it is not be affected. c. it becomes flat. 5 Wadi Nakhr in Oman is formed because water move away by the effect of erosion. d mountains c sediments a sunlight b. wind 6. Among canyons which have V-shape are a. Wadi Nakhr and the Small Canyon. b. the Colored Canyon and Wadi Rum c. the Small Canyon and the Colored Canyon. d. Wadi Nakhr and Wadi Rum. Put (V) or (X): 1. A carryon may be formed due to the effect of wind weathering and erosion. (Wadi Rum in Jordan is an example of dune. When the water is moving over the sand, it leaves an impression on it. A canyon is formed due to the effect of water stream on a flat land. A canyon may take one year only to be formed. (Qaiyoubia 2023) (All canyons are similar in shape of rocks and colors. (Behira 2023) (7. Earth's surface changes continuously as it is affected by weathering and) erosion. 8. Water streams that flow over flat land may form small carryons. 9. All canyons must have V-shape.

1. It is the landform that is formed by the effect of weathering and	d erosion
due to wind, water or other factors.	()
2 The two processes that have the main role in formation of can	yon. ()
Complete the following sentences by using the words below:	
(impression – water – canyon – gently)	
When the rain falls on a flat sandy land, it will leave an	on the land.
Wadi Nakhr in Oman is an example of landform.	
 3. Canyon is formed by the effect of the stream of 	
4. The sides of the canyon at the beginning of its formation are	sloped.
Give a reason for the following:	
Trees and other plants are growing on both sides of small canyo	ns. (Alex 2023)
What happens to?	
1. A flat land, if a water stream flows over it.	
	nger time.

LESSON TWO

Activity 4 Landscapes in Your Emirenment

- ▶ Put (√) or (x):
 - 1. When water flows quickly, it causes more erosion

- 2. Canyons may be formed due to the effect of weathering only.

- Imagine that you go to your school after a rainy day, you can see some changes in the school landscape due to some processes happened, for example :
 - You can see rounded and worn small rocks and that is an evidence of weathering process.
- · You can see an area with small canyons where soil was washed away after heavy rain and that is an evidence of erosion process.
- You can see a patch of sand in the playground after heavy rain and that is an evidence of deposition process.







▶ You can see the same processes happen in large landscapes in nature, where :

School landscape

Large landscape in nature

Weathering process:

Instead of weathering of small rocks at your school playground,



Mar.

you can see big rocks of a mountain were broken off.



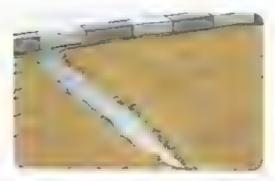
playground جرفت mountain رفعة من الرمل

washed away مستديرة patch of sand

School landscape

Erosion process:

Instead of small canyons in the land of your school,



Deposition process:

Instead of a patch of sand at your school playground,



Large landscape in nature

you can see the walls of a canyon were eroded by the effect of a river movement.



you can see a river makes new land from sediments by deposition.



₽ Note

It might be useful to recognize signs of weathering, erosion and deposition because it may help in building houses in safe places, where :

- People must not build a house on a hill that is eroding.
- People must not build a house very close to a river, as if the path of a river is changed, it causes weathering and erosion of the house.



Check your understanding

▶ Put (√) or (x);

- 1. We can't see any changes in our environment after raining.
- 2. In nature only, weathering takes place but in small landscapes deposition and erosion happen.

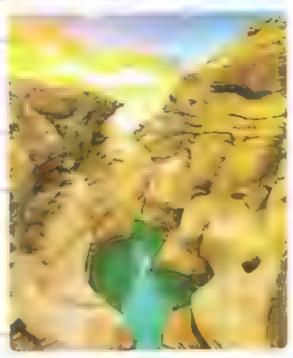
Activity 5 Canyon Communication

- ▶ Canyons are special types of valleys that have steep sides.
 - Many valleys including canyons are formed by the same way, where :

Gravity pulls rainwater downhill forming small streams.

These small streams join together forming a bigger stream (river).

The water of the river flows fast across the land and erodes a pathway through the landscape that makes the river carve out a valley.



○ Notes

- 1. The shape of a valley depends on several factors including:
 - The types of rocks exist in the landscape.
 - The speed, age and size of river that form the valley.
- 2. Big streams or rivers cause more erosion than small streams.
- 3. Rivers that flow fast cause more erosion than rivers with slow flow.

▶ Now, let's study one of the most famous canyons on Earth which is called the "Grand Canyon" :

Grand Canyon:

- It is located in United States of America.
- It is very large and steep canyon, and it contains many layers of rocks.
- This canyon contains a river in its bottom.



The Grand Canyon

downhill pull streams steep الأسفل bottom يسحب hver مجارى الأنهار

carve oul استيد الاتحدار pathways اسفل/ قع

ىدخت طرق

Formation of the Grand Canyon :

Over long period of time (millions of years), the water of the river there flowed so quickly due to travelling of the river down a steep slope.

The water of the river eroded the rock and cut them deeply.

The fast flow of water eroded a lot of sediment and carry them away that leads to the formation of the Grand Canyon.



Check your understanding

▶ Put (√) or (x):

1. As the stream gets bigger, it causes more erosion.	()
2. Rivers erode rocks and can form valleys and canyons.	()
3. Canyon walls are not very tall and have gentle slopes.	()
4. A canyon is a type of valley.	()
5. Rivers can change a landscape very slowly.	()
6. Fast moving rivers can cause a lot of erosion.	ì)

In the Assessment Book:

Try to answer:

Self-Assessment (19)

cut them deepty.

क्षेत्रका प्रवस्ते विकास संदर्भ

dead to

173 يۇدى إلى

Exercises on Lesson 2

Understand

ORRESTY

Migher Thinking Skitts

Choose the correct answer:

- 1 Among the evidence for the beginning of formation of small canyon by the effect of running water is
 - a, the deep slopes of its sides.
 - b trees and plants that are growing on its sides.
 - c, the little amount of rains that flow over it.
 - d the rocks and sediments that are found on its sides.
- 2. If the big rocks of a mountain were broken off, this is an evidence of
 - a. weathering process only.
 - b. erosion process only.
 - c. weathering and erosion processes.
 - d. weathering and deposition processes.
- 3. Recognize the sign of weathering, erosion and deposition may help in all the following, except
 - a. building houses in safe places.
 - b not building houses on hills that are eroding.
 - c. not building houses very close to a river.
 - d building houses on a hill affected by erosion.
- downhill. M n a 2023) 4. The rainwater gather in small streams due to the
 - a pushing force of gravity
- b pulling force of gravity
- c pushing force of friction
- d pulling force of friction
- can erode valleys and form canyons across them.
- b. Mountains
- c. Dunes
- d. Rocks
- 6. The shape of the valley depends upon all of the following factors, except
 - a, type of rocks.

b. speed of the river.

c. size of rocks.

- d, size of the river.
- When the water of a river travels downhill on a steep slope, its speed
 - a, stays constant.

- b. decreases to half.
- c. decreases to quarter.
- d. increases.
- 8. Rivers that flow fast can cause more than rivers with slow flow.

- a, chemical weathering
- b. erosion

c. deposition

d. formation

Put (V) or (X):	
1. The shape of a rock will be rounded and worn due to the effect of o	deposition
process.	(
2. The formation of a patch of sand in a certain place after a heavy ra	ıın is an
example of the deposition process.	(
3. Recognizing the signs of weathering, erosion and deposition may t	nelp in
building houses in safe places.	(
4. The Grand Canyon in USA is very large and steep.	(
5. Rivers cause less erosion of rocks than small streams.	(
6. The river movement can take the rocks away around mountains.	(
7. The Grand Canyon took short period of time to be formed	(
Complete the following sentences by using the words below:	
(speed – wind – sediments – valleys – gravity)	
The sides of a mountain could be broken down by the effect of weather erosion.	and
Canyon is a special type of that has steep sides.	2023
3 When the water of a river travels down a steep slope, its	increases.
The force of water stream can erode a lot of of a mountain them away.	n and carry
5. Rainwater is pulled downhill forming small streams due to the effec	t of

Give reasons for:

1. It might be useful to recognize signs of weathering, erosion and deposition

Valleys have different shapes.

(Ismailia 2023)

What happens ...?

- To a house that is built close to a river, if the path of the river is changed toward this house.
- 2. If a river erodes the sediments of a mountain over a long period of time.

(Ismailie 2023)

Complete the sentences below each picture using the following words: (Weathering – Erosion – Deposition)



Small rocks of a mountain

1. process.



Formation of new lands at river's end

2. process.



Carving of a mountain by a river stream

3. process.

LESSON THREE

Activity 6 Carryon and Valleys

- ▶ Put (√) or (x):
 - 1. All valleys have the same shape.
 - 2. Gravity helps in forming valleys and canyons.
- ▶ We have known that the canyons are a special type of valleys. Now, let's study the similarities and differences between canyons and valleys.

Canyons

- They are the areas that were eroded in mountains.
- Their walls are usually very high (have great depth), steep, narrow and consist of many layers of rocks.

Valleys

- They are lowland areas in between mountains.

Similard, s

- Both of them can be formed by rivers or streams.
- Both of them often have rivers or streams flow through the lowest points.
- They have gently sloped sides that usually surround a wide, flat plain.



A canyon



A valley



Check your understanding

Complete the following sentences using the words below:

(canyons - rivers)

- Valleys and canyons often have
- flow through the lowest points.
- 2. The walls ofare usually very high.

Activity 7 Delta Formation

In the previous activities, you have learned that valleys and canyons are formed by weathering and erosion processes.

In this activity, we will learn about deltas which are formed by deposition process, where :

Streams or rivers which flow fast carry sediments which called silt.



As the river water flows, it carries more and more sediments until the river water becomes full of sediments.



When the speed of the river water decreases, it drops the sediments (silt) forming deltas.



Small deltas

Note

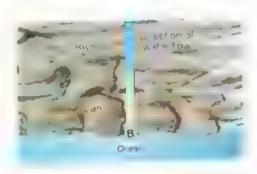
Silt is made of very fine bits of sand, clay or rock materials.

Most deltas are formed when fast flowing water enters slower moving water or still water such as :

A delta can be formed at area (A) as the river (fast flowing water) enters the lake (still water).



A delta can be formed at area (B) as the river (fast flowing water) enters the ocean (slower flowing water).

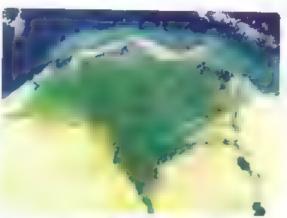


Notes

- 1. Large wetlands are formed in deltas.
- 2. Plants that grow in the wetlands found in deltas increase deposition process because
 - Plants are partly responsible for slowing down the river water.
 - Roots of plants help in trapping sediments.

The Nile River Delta:

- · From the most famous deltas in the world is the Nile River Delta.
- The Nile River Delta has a triangular shape and it lies between Cairo and the northern coast of Egypt.
- It was formed in Egypt as a result of the rapid flow of the Nile River.
- It is characterized by the presence of fertile soil that allows the cultivation (planting) of different types of crops.



The Nile River Delta



Check your understanding

▶ Put (√) or (x):

Deltas are formed by erosion processes.

2. Deltas are formed when the speed of river water increases.

In the Assessment Book: Try to answer Self-Assessment (20)

Exercises on Lasson 3

		● Understand ○ Apply	@ Higher Thicks	ng Skilla		
	C	noose the correct answer:				
	1.	The main difference between valleys	and canyons is that val	leys have		
		a. many rock layers.	 b. steep slope walls. 			
		c. gently sloped sides.	d. vertical walls.			
	2.	Walls of canyons are characterized by	all the following, except	that they		
		a. are very high.	b. are gently sloped.			
		c. have great depth.	d consist of many re			
	3.	When the speed of the water stream rate of erosion will	that is run over a moun			
		a increase. b. be constan	t. c. decrease.	d become sl	OW(er.
	4.	Deltas are formed when the speed of	f river water			
		a. increases. b decreases.	4 14 4	d. become fa	iste	۲.
	5	The delta is formed when the river st	ream entering all of the	following,		
		except		(GIZE		23)
		a a lake. b a sea.	c a mountain.	d an ocean.		
	6.	Nile River Delta is characterized by t	he presence of	that allows the	ne	
		planting of different types of crops.	N. 4 - 4 - 41	d fertile soil		
		a mountains b sand dune	s c polluted soil	0 lettile soil		
2	P	ut (V) or (X):				
	1.	Both canyons and valleys often have	e river in their bottom.	/ 2023	()
		The walls of valleys are vertical and			()
	3	Deltas are formed as a result of silt of	deposition.		(,
ì	4	The Nile River Delta was formed by w	reathering and erosion pi	ocesses only.	(,
		Nile River Delta has a rectangular sl			(,
	6	Plant roots help in trapping sedimen	ts that causes the incre	ase	,	,
		of deposition.			7	
	7	. Delta is formed when a running water	er meet a still water.		(
1	TV	Vrite the scientific term of each of th	ne following:			
	1	. They are lowland areas in between around rivers.	mountains and have ge	ntiy sloped sid	es	
	2	A land area that is formed by depos	ition process when a riv	er enters a lak	e	

or a sea.

Complete the following sentences by using the words below:

(sand - speed - deposition - rivers - canyon - silt)

- Both of valleys and canyons often have or streams flow through their lowest points.

 (Giza 2023)
- Deltas are formed when the of the river water decreases, which causes deposition of sediment.
- The plants of wetland and their roots cause increase of the rate of process.
- When the sides of a valley become steep, this valley may be changed into a
- 5. Fast flow rivers carry sediments which called , and it is made of very fine bits of, clay or rock materials.

Give a reason for the following:

Plants of wetland areas help in formation of deltas.

What happens if ...?

A river stream enters a sea.

(Alex. 2023)

Look at the following pictures, then complete the sentences below :



A river Picture (A)



A valley Picture (B)



A canyon Picture (C)

- 1. If the water stream in picture is passed through a flat land for a short period of time, the landform in picture may be formed.
- 2. The landform in picture may be formed by the effect of wind and water erosion for a long period of time.
- The landform in picture have gently sloped sides.
- 4. Both landforms in pictures and may have the water stream in picture in their lowest points.

LESSON FOUR

Activity 8 Wind Erosion

▶ Put (√) or (x):

- 1. The movement of wind can form different landforms over years.
- 2. Erosion and deposition processes can create some landforms.

In the previous lessons, you have learned that water can change the shapes of landscapes.

In this lesson, we will learn that wind also can be a powerful force of change of landscapes, where wind in desert can change the shape of rocks by erosion.

Wind erosion:

When wind blows across the land, it picks up sand and other rock particles and carries them along in the direction of the wind blows.



When this flying sediment hits a rock, it wears down that rock.



This process carves the rock into different shapes.



▶ Some landforms are created by erosion and deposition processes at the same time as sand dunes.

Sand dunes:

- Sand dunes are landforms which are made of windblown sand when something like rock blocks the wind.



Sand dunes in beach

- Sand dunes are common landforms between beach and sandy desert environments.
- Sand dunes usually seen in groups, and they may cover a large area.
- Sand dunes can be hundreds of meters tall.



Sand dunes in sandy desert

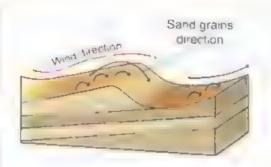
Sand dunes movement:

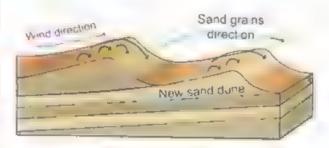
▶ Sand dunes are continuously moving as follow:

When wind blows across a dune, sand grains erode away from the side that wind is coming from.

The sand grains carried by the wind are collected along the slope of the dune.

When the sand reach the top, the dune forms a barrier to the wind, and then the sand grains roll down the other side,





- ▶ Generally, we can conclude that water and wind can change landscapes (such as canyons, mountains, dunes ... etc.) over time, where :
 - Running water can wear away the sides of a river or stream.
 - Wind can break down rocks.



- Complete the following sentences:
 - Sand dunes are formed by process and deposition process.
 - 2. The common landforms between beach and sandy desert environments are

Activity 9 Sand Shifter

- ▶ You have learned that sand dunes are formed when wind moves the sand and drops it in a place when something blocks the wind, then wind drops lots of sand in the same place.
- In this activity we are going to show by a simple experiment how sand dunes are formed and moving.

Tools:

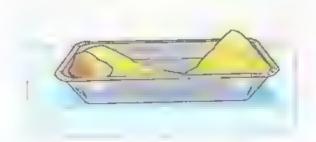


Steps:

- 1. Place a small rock in the pan at one of its sides.
- 2. Put suitable amount of sand at the other side of the pan.
- 3. Use the straw to blow air infront of the sand with a certain direction and small force, as shown in the figure.
- 4. Repeat the previous step with changing the direction and increasing the force of blowing.

Observations:

- 1. When blowing the air with a small force, sand travels a short distance, and by increasing the force of air blowing, sand travels a longer distance.
- 2. When the air blows at the same direction of the small rock, sand is blocked and collected infront of the rock.



Conclusions:

1. The wind moves the sand, where :

- The distance that the sand travels depends on the force of the wind.
- The way that the sand moves depends on the direction of the wind.
- 2. The dunes are often formed when something blocks the path of sand, such as rocks.



Check your understanding

Choose the correct answer:

- When the force of wind increases, the distance the sand travels increases.

 doesn't change.

 decreases.

 stays constant.
- 2. The are formed when something block the path of wind carrying sand.

mountains valleys sand dunes rivers

In the Assessment Book
Try to answer
Self Assessment (21)

Exercises on Lesson 4

Higher Thinking Skills O Appaly Understand Choose the correct answer: 1. The process of carving the rock into different shapes by wind blowing is c transportation. d weathering. a deposition. b erosion. 2. Sand dunes are formed by the effect of both 2023 processes. a mechanical weathering and deposition b. erosion and weathering c. erosion and deposition d. chemical weathering and erosion When the force of wind blowing , the sand travels for a longer distance. b becomes zero c doesn't change d increases a. decreases 4. Formation of sand dunes depends on of the wind blowing. b. direction only a. force only d neither force nor direction c both force and direction 5. Sand dunes are common landforms between environments. a beach and rainforest b beach and sandy desert d sandy desert and oceans c rainforest and sandy desert may be formed. When a rock blocks the path of flying sand, a d. canyon c. valley b. river a. dune and affect the distance and the way of sand that travels (Ismailia 2023) through air. b Sunlight – wind direction a. Wind force - sunlight d Sunlight – Earth's gravity Wind force – wind direction Put () or (X): Wind can pick up sand grains in forming sand dunes. . . . 2023 (2. Sand dunes are the landform that can be seen in both beach and sandy desert.

4. Sand travels for a short distance when wind blows with a great force.

5. Sand dunes usually seen separatly, and may cover a small area.

)

)

)

)

11 - 2023 (

3. Sand dunes are formed by erosion only.

6. Wind cannot break down rocks.

	do	Mountains are formed when something block the path of wind carrying sand.	(1
		8 Sand dunes are formed due to erosion and deposition processes caused by wind.	(
1		Write the scientific term of each of the following:		
		1. It is the process by which the wind carves the rocks		
		into different shapes.)
		It is the landform that is formed by erosion and deposition of sand in sandy desert environment. (*****)
3	7	Complete the following sentences by using the words below:		
		(direction - wind - rocks - decreases - hundreds)		
	,	Wind erosion can carve the unto different forms.		
		2. Sand dunes are in continuous motion due to the movement of		
		When the force of wind, the sand can't travel for a long distance.	2	
			x. 20:	231
9		4. Sand dunes may reach of meters tall.	201	-0/
اد		Sand can move forward or backward depending on the of wind.		
	100	Give reasons for:		
C		1. A sand dune may be formed in front a large rock in desert .		
٠		2. The distance that the sand travels depends on the force of the wind.		
6		What happens if?		
•		Wind that is carrying sand particles hits a big rock.	202	23)
-	2	Arrange the following sentences to show the steps of how wind can erode a rock:		
	(() Flying sediment hits the rock.		
	() Blowing of wind across a land.		
	() The sediment carves the rock into different shapes.		
	() Wind start to pick up sand and other rock particles and carries them as	vav	

LESSON FIVE

Activity 10 Dentilibing Landform

- In the previous lessons, you have learned about landforms and how they are formed.
 - Canyons and valleys are formed due to erosion by water and wind.
 - Deltas are fan-shaped (triangular shape) landforms where river enter lakes, seas or oceans and they are formed due to deposition process.
 - Sand dunes are formed due to erosion and deposition processes caused by wind.

▽ Note

During a storm or a rockslide, erosion can happen quickly but in general, erosion happens slowly.



Complete the following sentences using the words below:

(deltas – canyons – sand dunes – slowly – rivers – wind – quickly)

- are deep valleys with steep sides. 4.
- are fan-shaped landforms where rivers enter lakes or oceans. 2.
- are hills that are made of sand. 3.
- are often what causes the formation of both valleys and canyons. 4.
- and sand work together as forces of erosion in the desert
- 6. During a storm or a rockslide, erosion can happen
- 7. In general, erosion happens
- ▶ In the following table, write how each landform is caused by using the words below: (you can use the word more than once).

(Water - Wind)

	Canyons and valleys	Deltas	Sand dunes
Causes:			

Review on Concept (4.2)

To review this concept look at the Assessment Book "Part 2: Final Revision".

In the Assessment Book

Try to answer

- Self-Assessment (22)
- Model Exam on Theme (4)
- Questions of the school book on Theme (4)

fan-shaped

storm على شكل المروحة rockslide مثلت الشكل إبرلاق صخرى

Model Exam on Concept (4.2)



	(A) Choose the correct answer :	5 mark	(5)
	When a rock blocks the paths of flying sand, a may be formed.		
	a. dune b. river c. valley d. canyon		
	2. A canyon may be formed due to the effect of		
	a erosion and deposition b weathering and erosion.		
	c weathering and deposition. d deposition only.		
	3. Walls of canyons are characterized by all the following, except that they		
	a. are very high. b. are gently sloped.		
	c. have great depth. d consist of many rocks layers.		
	 The delta is formed when the river stream entering all of the following, except 		
	a. a lake. b. a sea. c. a mountain. d. an ocean.		
	(B) What happens if ?		
	A river erodes the sediments of a mountain over a long period of time.		
	the second of th		
4	(A) Put (V) or (X):	, r - A	
	Both canyons and valleys often have river in their bottom.	()
	Wadi Rum in Jordan is an example of dune.	()
	Sand dunes are formed by erosion only.	()
	Rivers cause less erosion of rocks than small streams.	()
	(B) Give a reason for the following:		
	Valleys have different shapes.		
Ď	(A) Complete the following sentences by using the words below:		
	(wind - rocks - decreases - hundreds)	· Marks	1
	1 Wind organia-		
	Wind erosion can carve the into different forms.		
	2 Sand dunes are in continuous motion due to the movement of		
	3. When the force of wind , the sand can't travel for a long distance		
	4. Sand dunes may reach of meters tall.		

(B) Look at the following pictures, then complete the sentences below:



A river Picture (A)



A valley Picture (B)



A canyon Picture (C)

- 1. If the water stream in picture is passed through a flat land for a short period of time, the landform in picture may be formed.
- 2. The landform in picture may be formed by the effect of wind and water erosion for a long period of time.
- The landform in picture have gently sloped sides.

Model Exam





(A) Write	e the scientific term of each of the following :	-	
	special type of valleys whose its sides are steep.	1	Marks
	e process by which the wind carves the rocks into different	shanes	,
	The state of the s	(
3. The tv	vo processes that have the main role in the formation of car	ivon.	,
		()
4. They a	are lowland areas in between mountains and have gently sle	oped side	s
around	d rivers.	()
(B) Corre	ect the underlined words :		
	are formed by weathering process. At . 2023	()
2. Wadi I	Nakhr is an example of valleys.	(
(A) Com	plete the following sentences :	`	
			nerth's
2 Rainw	the water of a river travels down a steep slope, its speed		
3 Sand	vater is pulled downhill forming small streams due to the effe	ct of	
4 Sand	can move forward or backward depending on the	of wind.	
	dunes are formed by erosion process and process		
	happens if ?		
A rive	er stream enters a sea.		
(A) Put (v	/) or (x) :		
	on may take one year only to be formed.	(50	narks)
2. The riv	er movement can take the rocks away around mountains.	()
3. Nile Ri	iver Delta has a rectangular shape.	()
4. Sand o	dunes usually seen separatly, and may cover a small area.	()
(D) A =====	and the fall area.	- ()
a rock		d can eroo	le
() Fly	ing sediments hit the rock.		
() Blo	wing of wind across a land.		
	e sediments carve the rock into different shapes.		
() Wir	nd starts to pick up sand and other sant are		
	nd starts to pick up sand and other rock particles and carries	s them aw	/ay.



SCIENCE

By A Group of Supervisors





Assessment Book



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SECOND TERM

This Assessment Book

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Part

Self-Assessments:

Include:

- Cumulative self-assessments on lessons of each concept.
- Cumulative model exam on concepts.
- A model exam on each theme.
- Questions of the school book on each theme.

Final Revision:



Review on each concept.



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(Page 3)

Part



(Page 66)

3

Part

Final Examinations:

Include:

- El-Moasser final examination models.
- Final examinations of some governorates.



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Part

Projects

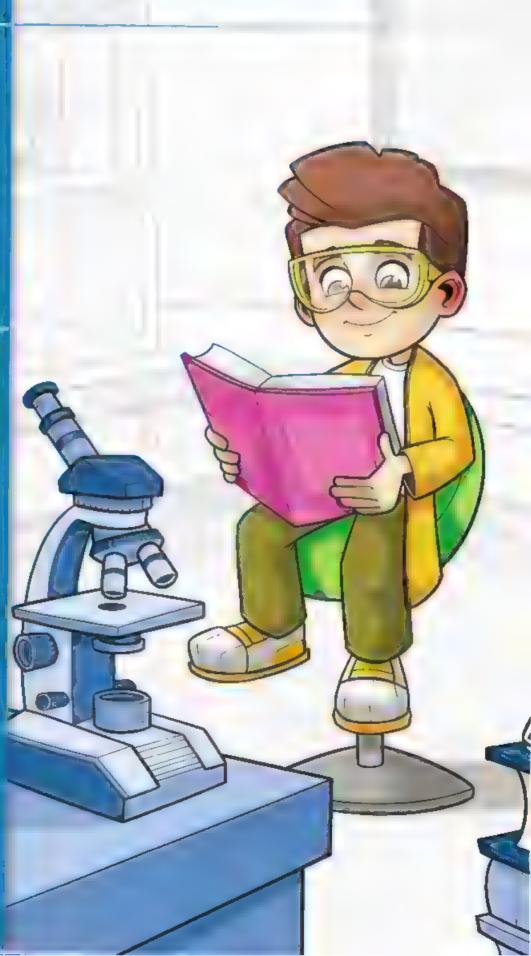
Include:

- Unit three project.
- Interdisciplinary project.
- Unit four project.



SELF-ASSESSMENTS





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Concept

- Self-Assessments from (5) to (9) _____ 12 - 16

- Model Exam on Concepts

(3 1) & (3 2) 17 - 18

Renewable Energy Resources:

Concept

 Self-Assessments from (10) to (12) ___19 - 22

- Model Exam on Theme (3)

- Assess your learning. Questions of the school book on Theme (3) _____ 24 - 25 THEME FOUR | Change and Stability

UNIT FOUR: Shifting Surfaces

Breaking Down and Moving Rocks:

Concept

from (13) to (17) 26 - 30

- Self-Assessments

- Model Exam

on Concept (4.1) ____ 31 - 32

Changing Landscapes:

Concept

- Self-Assessments from (18) to (22) ____ 33 - 37

- Model Exam on Theme (4) 38 - 39

- Assess your learning Questions of the school book on Theme (4) _____ 40 - 41

Self-Assessments

on Concept (3.1)

0		Un On	Lesson 1		
(A) Put (✓) or ((x) :				
1. The Mars ro	ver Curiosity conve	rts sound energy	into kinetic energy.	1	١
	Curiosity can be ope			,	۱
	nergy in batteries is			(ر ۱
	on for the followin			`	
	bot uses the sunligi	_	or its operation.		
		-			
(A) Write the se	cientific term of ea	ch of the followi	ng :		
1. The energy p	produced from hand	bell	(_	,)
	energy that is stored	d in the battery of	a remote		
controlled to			())
	controlled vehicle us	sed to explore the	surface of		
planet Mars.			())
(B) Name two d control.	evices that can be	operated from a	distance by using a r	emote	
3 Look at the opp	oosite figure, then	choose the corre	ct answer :		
	is to mo				
a. water	b. wood				
c. fuel	d. energy	1		200	
To keep playing the battery run or recharge the	ng with the toy car one battery	when	25		
a. heat	b. cool		Catholic Street		
c. replace	d. freeze			and have	
	nergy that is used in	n operating this a	as in		
a. sound	b. light	c. thermal		gy.	
	3	V. WICHIGI	d. electrical		

4	(Δ)	Complete	the	following	sentences	
T.	(H)	Complete	uic	Tonowing	Sellectices	

- When you rub your hands together, the consumed energy is energy, while the produced energy is energy.
- The produced energy in a toy car that causes its movement is energy, while the produced energies in a hair dryer are energy and sound energy
- The produced energy from coal when burned is energy, that is converted into energy used to operate the machines of electric power stations.

(B) Give a reason for the following:

The thermal energy produced from burning coal is used in some electric power stations.

[A] Put (V) or (X):

- Curiosity robot needs sound energy to be operated.
- 2. The electric lamp is the primary source of most energies on the Earth. ()
- 3 The washing machine converts electrical energy into kinetic energy. ()

(B) What happens to ...?

The change of energy when you press on the spring of the soap dispenser.

Look at the opposite figure, then complete the following sentences:

- This living organism can convert energy of the Sun into energy stored inside it.
- If the wood of this organism is burned, ... energy is produced.
- After death and burying of this organism over millions of years, it becomes coal that stores energy.
- The formed coal can be used in electric power stations to generate energy



3 til Lesson 3

🕖 (A)	Choose the correct answer:		
1. 1	Mars rover Curiosity uses	to be operated.	
8	. solar energy and electrical energ	у	
Ė	solar energy and potential energ	у	
C	e electrical energy and potential er	nergy	
C	l. electrical energy and sound ener	тду	
2. \	White playing a drum, er	nergy is converted into	energy.
a	n. sound – kinetic		
b	o. sound light		
0	. kinetic – sound		
C	l, kinetic – light		
3.1	n a bicycle, a part of kinetic energy	is converted into	energy due to
t	he friction of its tires with the road.		
8	. sound	b. thermal	
C	. light	d. chemical	
(B)	What happens to?		
	The change of energy when you n	ub your hands together.	
			* ** 4
3 (A)	Correct the underlined words:		
1. E	nergy can neither be created nor	destroyed, but only converted	d from one form
to	another, this is the law of consum	ning of energy.	()
2. T	he consumed energy while burning	g some pieces of wood is the	thermal
	nergy.		()
3. T	he lighted lamp produces chemica	energy that makes you feel	warmth when
	ou put your hands near it.		(
(B) !	Mention two devices that convert sound energy.	electrical energy into both	kinetic and

Look at the following figures, then complete the following sentences:









Device (2)

Device (3)

Device (4)

- The electrical energy is used to operate devices number and
- Kinetic energy is produced in devices and to help them do their functions.

(Belf-Assessment) 4

till Lesson 4

(A) Complete the following sentences:

- The output energy of burning coal is energy, which is used to produce energy in electric power stations in order to generate electrical energy.
- The output energy that helps the washing machine to do its main function is energy, and this energy is considered the energy of the hand bell.
- 3. The input energy of the toy car is energy that is stored in its battery and then converted into energy in its wires to operate its motor.

(B) Give a reason for the following:

Sound energy and thermal energy are considered as wasted energy in the vacuum cleaner.

2	(A) Write	the	scientific	term	of	each	of	the	followin	g	
---	-----------	-----	------------	------	----	------	----	-----	----------	---	--

- 1. The input energy of a television.
- 2. The wasted energy in a computer when it is used for a long time. (______)
- The output energy of the washing machine which helps it do its main function.

(B) Mention the input and output energies of the opposite device :

- 1. Input energy:
- 2. Output energy:



Electric Iron

Look at these electric devices, then complete the following sentences:







Device (2)



Device (3)

- 1. Sound and light energies are produced in the device number and help it do its function.
- 2. Kinetic energy is produced in devices number and
- Noise from devices number and is wasted energy, because sound doesn't help the devices do their functions.
- 4. All of these devices are operated by energy that is transmitted from stations through wires.

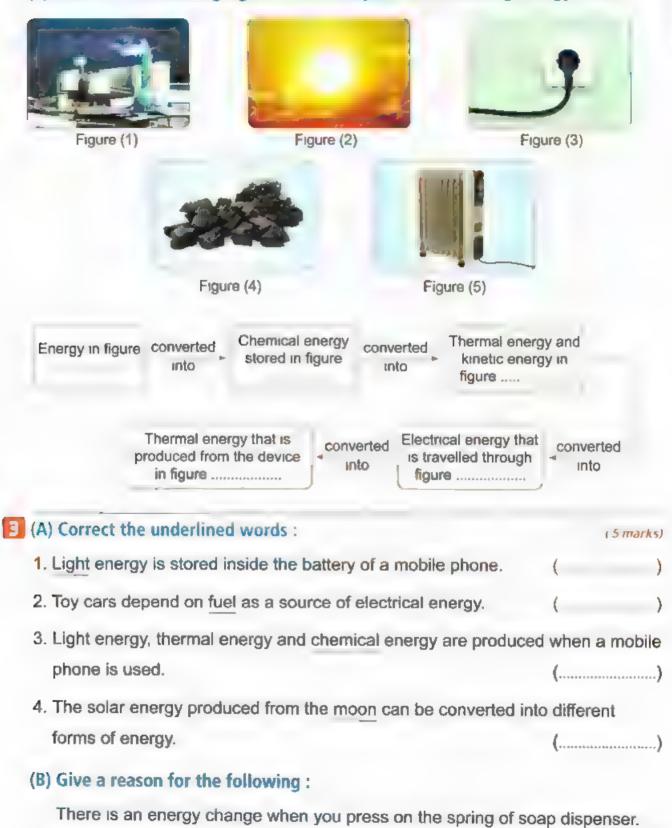
Model Exam

on Concept (3.1)



(A) Choose the correct answer:				rks)
1. Mars rover Curiosity is designed to	explore the			
a. planet Earth.	b. planet Mars.			
c. Sun.	d. moon.			
2. Plants can convert the light energy		energy wh	ich	
is stored inside the plant in the form	_			
a. sound	b. electrical			
c. chemical	d. kinetic			
3. When a piece of coal is burned,	energy is produced.			
a. thermal	b. kinetic			
c. sound	d. potential			
4. Inside a light bulb, electrical energy	y is converted into	and		
energies.				
a. sound – light				
b, sound – thermal				
c. kinetic – light				
d. light - thermal				
(B) What happens if?				
You put your hands near a lighted	lamp.			
(A) Put (✓) or (X):			(5 mai	rks)
 There is stored chemical energy in 	side the food we eat.		()
2. The input energy in a hair dryer is	the chemical energy.		()
3. As a result of friction between bike	's tires and the road, kineti	c energy		
changes into chemical energy.			()
4. We can convert the solar energy in	nto different forms of energ	y.	()

(B) Look at the following figures, then complete the following energy chain:



11

Self-Assessments

on Concept (3.2)

Belf-Assessment 5 On Lesson 1

1	(A) Choose the correct answer :				
	1. To move a car, the fuel must be	the car engine at first.			
	a. freezed inside	b. cooled inside			
	c. burned inside	d. removed from			
	 On driving a car for a very long disdescribes the most important things. The presence of passengers. The presence of a radio. The fuel tank is completely filled the fuel tank contains a little and tank contains a little a	for the driver? I with gasoline.	ntences		
	c. electrical energy.	d. thermal energy.			
	(B) Give a reason for the following: The importance of wood and coal				
2	(A) Put (V) or (X):				
	Energy that is produced from burn to move a car.	ing gasoline, cannot be used	())
	2. Burning of all forms of fuel produce	es thermal energy.	()	ļ
	3. If the fuel in a car decreases during the nearest fuel station to supply the		t ()	
	(B) Mention three different forms of	fuel.			
3	Put each of the following words in f				
	•	asoline – Thermal energy]			
	1. It is a form of fuel that is used in diff		()	
	2. It is a form of fuel that is used in wa		()	J
	3. It is a form of energy which is produ		()	J
	4 The main source of most energies	on the Earth's surface.	()	

Self-Assessment 6 till Lesson 2

(A) Choose the correct answer	r:	
 Car engines can be operate 	ed by	
a. coal only.	b. coal and wood.	
c. gasoline only.	d gasoline and natural gas.	
Fossil fuels were formed un after a period of	ider the Earth's surface from dead plants or animatime.	als
a. very short b. short	c. very long d. long	
3. The two main types of fuel a	are	
a. wood and coal.	b. water and wind.	
c the Sun and the moon.	d fossil fuels and biofuels.	
(B) Give a reason for the follo		
Biofuel is considered as a		
 Coal can be used to product Coal, gasoline and wood are The nonrenewable resources What happens if? 	e electrical energy. considered as renewable resources of energy. (s of energy include coal, gasoline and water. (
	under the Earth's surface over millions of years.	
Choose from column (B) what	suits it in column (A) :	
(A)	(B)	
Form of fuel	We can get it from	
1. Wood 2. Oil	a. wood chips and grass.	
3. Coal	b. cutting of trees.	
4. Liquid biofuels	c. decomposition of sea creatures underground	
T. LIQUID DIDIDEIS	d docomercitical is a second	

e. boiling water,

3.

2.

1.

d. decomposition of plants remains underground.

4.

13

Suif-Augustument 7 til Lesson 3

[] (A) C	hoose the correct answe	r:		
1. To	produce steam inside the	e electric power station, we have to	3	
	cool water.	b. freeze water.		
C.	heat water.	d. cool fuel.		
	e devices in the electric plied	power station which operated by st	eam are	
a.	generators.	b. turbines.		
С.	tubes.	d. wires.		
3. Th	e generator inside the ele	ectric power station, turns		
	water into steam.	b. steam into water.		
c.	electrical energy into kine	etic energy.		
d.	kinetic energy into electri	ical energy.		
(B) W	/hat happens if?			
		power station is damaged.		
(A) D	hat held on the			
	ut (<pre>v) or (X):</pre> hen fuel is burned, it prod	duces thermal energy.	()
		ergy into electrical energy.	()
		iced from electric power station	,	•
3, 11 C8	in be used in houses, stre	eets and factories.	()
t	hose between brackets:	entences by choosing the correct		
us	sed to generate electrical	able – renewable] resources of end energy.		
2. Tu	urbines in electric power s	stations are operated by the effect	of [steam sand	IJ.
	ectrical energy travels fro rough [cars – wires].	om electric power stations to house	es e	
Fron	n your understanding of ions. Put each of the follo	how electricity is generated in electricity is generated in electricity in front of its suitable	ectric power le sentence :	
3444	[Coal – 9	Steam – Turbine – Generator]		
1. Its	s movement produces kir	netic energy.	()
	changes kinetic energy in		(_)
3. It	is a type of nonrenewable	e resources of energy.	(_)
4. It	is resulted from heating th	ne water and it turns turbines.	()

(Belinkerserenning) 8 til Lesson 4

(A) Choose the corre	ect answer:
----------------------	-------------

1	A) Choose the correct answer:	
-	I. When carbon dioxide gas increase	s in air, the Earth's temperature
	a. decreases slowly.	b. increases slowly.
	c. decreases fastly.	d. doesn't change.
2	2. All forms of fossil fuel are formed	D0488835144-84844
	a. above the Earth's surface.	b. under the Earth's surface.
	c. above the water surface.	d. in the air around us.
1	We have to protect rocks of building	gs from
	a. global warming.	b. oxygen gas.
	c. acid rain.	d. carbon dioxide gas.

(B) Give a reason for the following:

Burning of coal and oil causes the increase of the Earth's temperature,

-						
7	(Δ)	Put	W	ori	(X)	
	14.77		17		נייי)	

Acid rain causes global warming.	()
2. Burning of fossil fuels produces gases that don't cause global warming.	()
3. Acid rains have negative effects on both soil and water of lakes.	()

(B) What happens to ...?

The Earth's temperature if the amount of gases produced from burning of fossil fuels increases to very high limit.

Scientists do some experiments to know the bad effects of some different sources of pollution on living organisms.

Match each experiment with its correct observation:

The experiment	The observation
Exposing a dog to cars smog for a few minutes	a. its leaves turn brown and it will die.
Placing a building rock in a cup contains a sample of acid rain for a long period of time	b. irritation of its eyes and lungs.
Watering a small plant with acid rain for a week	c. it will decompose into small rocky particles.

TOT O WOOK		particles.
1	2	3

1. The energy that originally of	auses the formation of fuels is		
a. wind energy.	b. water energy.		
c. solar energy.	d. electrical energy.		
2. As the time passes, the am	ount of coal will		
a increase.	b. decrease.		
c. remain constant.	d. increase then decrease.		
3. Burning of fossil fuels produ	uces		
a. only gases that pollute th	e air.		
b. only thermal energy			
c. gases that pollute the air	and solar energy.		
d. thermal energy and gase	s that pollute the air		
(B) Give a reason for the follo	owing:		
Burning fossil fuels causes	global warming.		
(A) Put (✓) or (X):			
1. Renewable forms of fuel ca	n be replaced faster than nonrenewable		
forms of fuel.		(1
2. Mixing of water with oxyger	gas produces acid rain.	(
3. Burning coal releases gase	s which cause air pollution.	(
(B) What happens to?			
	live in a city that has too much cars smog.		

[global warming – heat – raises – gases]

From the disadvantages of using fossil fuels is that when they are burned, that cause air pollution and trap in the atmosphere, and changes which the temperature on the Earth, that causes the Earth's climate.

Model Exam

on Concepts (3.1) & (3.2)



(A) Choose the correct ans		(5 marl				
A form of biofuels which	 A form of biofuels which can be used in warming houses and coo is 					
a, wood.	F					
c. water.	b. wind.					
	d. sand.					
converts into thermal ene	rub your hands together, because ergy.	energy				
a. kinetic	b. light					
c. electrical	d. sound					
All the following are from a. the death of trees.	the harmful effects of acid rain, except					
 b. the change in the cher 						
c. the increase in the Ear	th's temperature.					
d the change in the chen	nical nature of lakes.					
4. A form of fossil fuels that is	was formed from the decomposition of	plant remains				
a. wind.	b. coal.					
c. wood.	d. sand.					
(B) Give a reason for the fo	llowing:					
	car needs a battery to move from one p	lace to another				
(A) Put (V) or (X):		(5 marks				
1. Grass and wood chips ca	n be used to make a liquid fuel.	(
	e chemical energy in your body change	s				
The movement of a turbin chemical energy.	e in the electric power station produces	,				
4. Energy may be destroyed	inside different devices	(
	another different devices.	(
(B) What happens if?						
Pesticides mix with water	of canals and rivers.					

(A) Complete the following sentences:	(5 marks)
The change of electrical energy into sound energy in the that proves the law of	e radio is an example
The generator in the electric power station changes electrical energy.	energy into
3 In any energy chain, some of the energy is wasted in the	e form of
4. Curiosity is a robotic vehicle that is designed to explore	the surface of
(B) Write the scientific term of each of the following:	
 The main source of most forms of energy on the Earth's 	surface. (

2 The energy resources that include wind energy, water and solar energy.

Self-Assessments

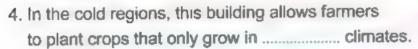
on Concept (3.3)

Self-Assessment 10 On Lesson 1

(A) Choose the correct answer:						
The solar panels use solar energy light up lamps of light posts in street		sed to				
a. thermal	b. kinetic					
c. electrical	d. light					
All the following are considered as except	nonrenewable energy resources,					
a. coal.	b. wind.					
c. natural gas.	d. petroleum.					
Wind turbines generate electricity to devices, except	hat can be used to operate all the follow	wing				
a. television.	b. electric blender.					
c. hair dryer,	d. hand bell.					
(B) Give a reason for the following:						
Modern water turbines are connec	cted to generators.					
(A) Put (\(\rangle \) or (\(\rangle \) :						
Wind and water are considered as		()				
2. Water is used to operate wind turbi		()				
Hundreds of years ago, people used	d windmills to crush grain to make flour.	()				
(B) What happens if?						
Radiant energy that comes out of	the Sun enters the greenhouses.					

3 Look at the opposite picture, then complete the following sentences:

- 1. The name of this glass building is
- The idea of working of this glass building depends on collecting the energy coming from the Sun.
- 3. The received energy is converted into energy that warms the inside of this building.





Self-Assessment 11 till Lesson 2

- 1 (A) Complete the following sentences:
 - Radiant energy is used to generate electricity directly by using
 or indirectly as it causes blowing of that is used to rotate wind turbines.
 - A wind turbine spins faster when the kinetic energy of increases.
 - 3. The energies that are produced from modern wind turbines and old windmills are considered as energy resources.
 - (B) Give a reason for the following:

Some electrical devices have solar panels.

-	/AN	Put	6.1	0.00	(w)	
	IAI	Pul	1V J	Of 1	M	
	10.17	,	X" /		v · /	-

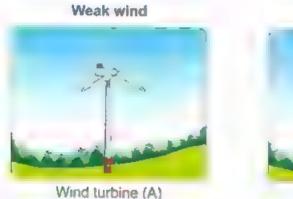
- 1 Solar panels are used to generate sound energy in some types of street lamps.
- When the kinetic energy of wind that is applied to the wind turbines increases, they produce more electricity.
- 3. Both solar panels and natural gas are renewable energy resources. ()

(B) What happens if ...?

The kinetic energy of wind applied to the wind turbines decreases.

If the two wind turbines in front of you are affected by the different wind forces.

Answer the following questions:





nd turbine (A) Wind turbine (B)

- 1. Which wind turbine spins faster? (Give a reason for your answer).
- 2. Which wind turbine generates less electrical energy?

Self-Assessment 12 till Lesson 3

(A) Correct the underlined words:

- The energy that is produced by <u>wind</u> turbines is called hydroelectric energy.

 (....
- Wind turbines produce more electricity when the wind blows
 with more potential energy.
- 3. Greenhouses convert radiant energy coming from the Sun into light energy that is used to plant crops which grow in warm climates.

(B) Give a reason for the following:

Wind turbines are placed in windy places.

2 (A) Cross out the odd word:

- 1. Water Wind Coal Sun.
- Solar water heater Hand mixer Solar panel Greenhouse.
- Gasoline Coal Natural gas Wind.

(B) Compare between water turbines and solar panels in the table below:

Points of comparison	Water turbines	Solar panels
Source of energy that is used to operate it:		
2. The produced energy :	energy.	energy.

		_							
3	Look	at	the	figure,	then	put (or ((X)	

1. Water in the area (A) can be used in rotating	water	
turbines.	()

- 2. Water in the area A has no kinetic energy. ()
- Water in the area ® may evaporate in the presence of sunlight.
- 4. When water in both areas A and B evaporates, it never returns back to the river.



Model Exam



on Theme (3)

(A) Complete the following sentences:	(5 marl	ks)
Remote controlled toy car changes — energy stored in its batterie	s into	
energy that in turn changes into energy which is used to the car.	o move	
When you rub your hands together, the energy is converted into energy.	0	
Coal, and can be used in generating electricity.		
4. Wind turbines and windmills use the energy of to be powered.		
(B) Mention one use for the following: Water turbines.		
2 (A) Put (V) or (X):	(5 man	ks)
1. We have to reduce the usage of the Sun as a source of energy	()
2. As a result of global warming, the temperature on the Earth increases.	()
3. Both wind movement and water flow have kinetic energy	()
In the soap dispenser, potential energy changes into kinetic energy.	()
(B) Give a reason for the following:		
The importance of generators in electric power stations.		
3 (A) Write the scientific term of each of the following:	(5 mar	ks)
A panel designed to absorb sunlight to generate electricity		_)
It is any substance which produces thermal energy on burning. ()
A robotic vehicle which is designed to explore the surface of Mars ()
4. The energy used when playing a drum.)
(B) What happens to?		

The car movement when the fuel runs out.

Annual year Learning

• Choose the correct answer:

1.	. Energy doesn't destroy, nor create from nothing, this indicates		
	a. the draining of energy resources.		
	b. conservation and transformation of energy.		
	c, resources of energy are numerous.		
	d, destroying the energy resources.		
2.	The produced energy from radio that reflects its main function is energy	ergy.	
	a electrical b. sound		
	c. light d. chemical		
	The idea of design and work of the robot that explores the surface of Mars depends on the idea of transforming a. electrical energy to kinetic energy. b. potential energy to kinetic energy. c. light energy to electrical energy. d. kinetic energy to electrical energy. In our daily life we use devices which depend on energy forms. Which of the following uses is true? a Computer depends on kinetic and electrical energy. b. Ceiling fan depends on electrical energy.		
	 The function of television depends only on the hydroelectric energy. Cell phones depend on potential and kinetic energy for operation. 		
5.	Which of the following energy forms isn't produced from the Sun? a. Thermal energy. b. Light energy. c. Kinetic energy. d. Radiation energy.		
6.	Rearrange the following steps to describe how coal is formed.		
	a. The Earth surface plants got old and died.	()
	b. The remains of the plants were decomposed and covered with sand and clay layers.	()
	c Anciently. Earth was containing with swamps where plants grow.	()
	 d. Several layers of clays and sands were deposited on the remains of dead plants. 	()
	e The buried plants were changed into coal due to the effect of heat and	,	
	pressure.	{)

Choose the correct answer :

- 7. Which of the following is a preferred natural resource to generate clean energy?
 - a. Ocean and river water.
- b. Trees and dry herbs.
- c. Water, coal, and oil.
- d. Coal and natural gas.
- are used in converting light energy to electrical energy.
 - a. Wind turbines

b. Water turbines

c. Solar panels

- d. Windmills
- is a renewable source of energy.
 - a. Coal
- b. Natural gas
- c. Water
- d. Fossil fuel
- 10. The produced energy from flowing water of waterfalls and dams and operating turbines is called
 - a. mechanical energy.
- b. hydroelectric energy.

c. chemical energy.

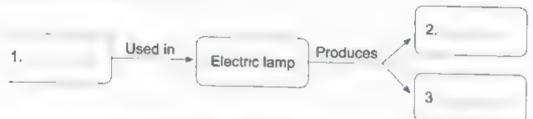
- d. kinetic energy.
- is considered one of the resources that we consume at a faster rate than it is formed
 - a. Wind

b. Water

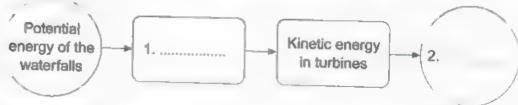
c. Solar energy

d. Fossil fuel

12. Complete the following model:



13. Complete the following model to describe the hydroelectric energy, and then determine the input and output energies of this system?



- 3. Input energy:...
- 4. Output energy:

Self-Assessments

on Concept (4.1)

Self-Assessment 13 On Lesson 1

1 (A) Correct the underlined words :			
1. The deep valley that is carved by flowing water, is known			į,
as coastal rock.	()
Disappearance of a sandcastle in few minutes is an example of slow changes.	()
of slow changes. 3. Canyons are formed due to fast changes.	()
(B) Cross out the odd word:			
Formation of canyons – Formation of valleys – Disappearance of	()
a sandcastle – Breaking down of costal rocks.	`		
2 (A) Put (✓) or (X):			
 Both of sandcastles and canyons can be formed in few hours. 		()
2. There are some similarities between sandcastles and coastal rock	S.	()
Canyons have sloping at sides like that of coastal rocks.		()
(B) Give a reason for the following:			
Sandcastle on a seashore may disappear in few minutes.			
Complete the following sentences using the words below:			
(minutes - slow - years - fast)			
Formation of coastal rocks and canyons takes many , s considered as , changes.	o this is	5	
2. Disappearance of sandcastle on a seashore takes few	, so this	s is	
considered aschanges.			
Self-Assessment 14 till Lesson 2			
(A) Correct the underlined words:			
1. The movement of sediments from one place to another, is know	,		1
as deposition.	(,
2. Weather is the breaking down of rocks on Earth's surface into	()
tiny pieces.	(/
3 Plant leaves grow inside the cracks of rocks which become wider.	. (/

(B) V	Vhat	happens	if.	?
-------	------	---------	-----	---

Water in cracks of rocks freeze and melt several time.

2	ZAL	Put	61	0.5	101	ı
<u>.</u>	VOV	rut	W 1	U	$\langle \Delta \rangle$	

 Water may cause mechanica 	al and chemical weathering.	()
---	-----------------------------	-----

- 2 Chemical weathering could occur due to the acid that is produced from lichens or present in some rains.
- 3. Limestone caves are formed due to friction between sand and rocks.

(B) Give a reason for the following:

Plant roots play an important role in mechanical weathering.

3 Classify the following examples in the table below:

- 1. Rusting of an iron statue.
- 2. Formation of limestone cave.
- 3. Break down of rocks by plant roots.
- 4. Break down of a rock statue by wind.
- 5. Break down of rocks by acid rain.
- 6. Dissolving minerals of rocks by acids of lichens.

Mechanical weathering	Chemical weathering

Self-Assessment 15 till Lesson 3

(A) Put (V) or (X):			
(rt) 1 at (r) of (rt) .			
1. Crushing a piece o	f biscuit by hands can rep	resent a type of	
chemical weathering			(
	icture of an iron statue an	e changed due to	(
rusting process.	ormed withen few hours.		(
			`
(B) Give a reason for			shamical
	in water containing anta	cid considered as a	chemical
weathering.			
	owing sentences using t		
(wat	er – chemical – weather	ing – mechanical)	
1. The weath	ering makes greater chan	ges than we	eathering.
	ering makes greater chan hanical weathering can b		eathering.
2. Chemical and med		e caused by	
2. Chemical and med	hanical weathering can b	e caused by ken into small pieces	
 Chemical and med If the color of a state both types of 	hanical weathering can be tue changes and it is broke process are happened	e caused by ken into small pieces	
 Chemical and med If the color of a state both types of (B) What happens if 	hanical weathering can be tue changes and it is broke process are happened	e caused by ken into small pieces to it.	s, this means
 Chemical and med If the color of a state both types of (B) What happens if 	hanical weathering can be tue changes and it is broke process are happened	e caused by ken into small pieces to it.	s, this means
 Chemical and med If the color of a state both types of (B) What happens if A piece of cookies 	hanical weathering can be tue changes and it is broke process are happened ? s is placed in a cup of wat	e caused by ken into small pieces to it. ter containing antaci	s, this means
 Chemical and med If the color of a state both types of (B) What happens if A piece of cookies 	hanical weathering can be tue changes and it is broke process are happened	e caused by ken into small pieces to it. ter containing antaci	s, this means id.
2. Chemical and med 3. If the color of a state both types of (B) What happens if a A piece of cookies Classify the following	hanical weathering can be tue changes and it is broke process are happened? s is placed in a cup of wate g factors that causing we	e caused by ken into small pieces to it. ter containing antaci eathering in the tab	s, this means id.
 Chemical and med If the color of a state both types of What happens if a piece of cookies Classify the following Wind. 	hanical weathering can be tue changes and it is broke process are happened? Is is placed in a cup of water graces that causing we 2. Water. 5. Plant roots.	e caused by ken into small pieces to it. ter containing antaci eathering in the tab 3. Acids.	s, this means id. le below :

Self-Assessment 16 till Lesson 4

1	(A) Correct the underlined words :			
	Weathering process followed by deposition process in reshaping Earth's surface.	(,
	2. Sand grains can be carried for a short distance by strong wind.	(1
	 When sediments are deposited at the end of a river, a sand dune is formed, 	(P114444	4
	(B) Cross out the odd word:	,		,,,,,
	Limestone caves – Red rusts in iron rocks – Freezing of water inside rock cracks – Breaking down of rocks by the effect of acid rains.	()
2	(A) Put (V) or (X):			_
	 You can see the reshaping of Earth's surface during its occurance. If there is no erosion process, there is no deposition process in 		()
	another place.		()
	3. Delta may be formed by the effect of weathering process only.		()
	(B) What happens if?			

3 Study the following two figures of sand grains, then put (\checkmark) or (x) below:

The gravity acts on broken weathered rocks at the top of a mountain.







Figure (1)	Figure (2)		
 The action of water erosion appear 		,	1
2. Gentle wind causes the deposition	of sand grains in figure (1)	(
Both figures (1) and (2) show sand	dunes that are formed as	()
a result of wind deposition.		()

Gell-Maagasamette.	
(A) Correct the underlined words :	
Hills of sand which are found in deserts and seashores are known	,
as canyons.	í
Erosion process means that wind or water break down rocks. (í
3. Erosion process is usually followed by weathering process. (,
(B) Give a reason for the following:	
If there is no erosion process there is no deposition process in another place	4
2 (A) Put (V) or (X):	
After deposition of eroded materials it may wear down again	
by wind or water.)
2. Erosion and deposition are two linked processes.)
3. Both of small sand dunes and costal rocks need few	,
days to be formed.	,)
(B) What happens if?	
Weathering process doesn't occur.	
Samuel All and	
3 Study the following two figures, then put (✓) or (X) below:	
Cairo	
El Giza	
Figure (1)	, ,
Figure (1) represents a triangle-shaped delta.	(
2. Figures (2) occurs due to the deposition of sediments and mud in a desert.	(
3. Formation of figure (1) takes longer time than formation of figure (2).	(
4. Water erosion play an important role in formation of sand dunes	,

that present in figure (2).

Model Exam on Concept (4.1)



(A) Write the scientific to	rm of each of th	e followin	g :		(5 marks)
1. The disappearance of	ı sandcastle as a	result of its	s hitting		
with the sea waves.				()
2. It is a type of caves that	it is formed when	n dissolved	minerals of		
rocks combine again is	new shapes.			()
3. Process in which the r	noving sediments	are dropp	ed in		
a new place.				(
4. A hill of sand created to	y the wind.			()
(B) What happens if?					
A red-colored rust is f	ormed on some r	ocks.			
(A) Choose the correct a	nswer:				(5 marks
1. As a result of breaking	down of	, sand i	s formed.		
a. rubber b. pla	stic c. re	ocks	d. glass		
2. The breaking of rocks	nto smaller parti	cles withou	ut changing the	ir prope	erties is
called				. ,	
a. mechanical weather	ing. be	b chemical weathering.			
c. deposition.	d. e	rosion.			
3. The deep narrow valle	with slopes at it	ts sides an	d often with wa	iter stre	am
flowing through it is kn					
a. canyon. b. mo	untain. c. hi	ill.	d. river.		
4. Lichens produce	on rocks tha	at dissolve	minerals found	in thes	se rocks.
a. oxygen b. ac		ater			
(B) Give a reason for the	following :				
Water play an importa		47			

3	(A) Complete th	ne following sentences using the wo	rds below: (5 mar)	(S)	
		(chemical – mechanical – wind –	weathering)		
	1. During	process, rocks are broken down or weared away.			
	2. Formation of	limestone caves is an example of	weathering.		
	Air moving from into smaller p	in breaking down of rocks			
	4. There are two weathering.	weathering and chemical			
	(B) Correct the	underlined words:			
	1. The dropping	as weathering. ()		
	2. Small sand of	lunes are formed due to strong winds	. ()	

Self-Assessments

on Concept (4.2)

(A) Choose the correct answer:

- has brown and black colors.
 - a. The Small Canvon
- b. Wadi Nakhr
- c. The Colored Canyon
- d. Wadi Rum
- are formed by the effect of water stream.
 - a. Mountains b. Dunes
- c. Hills
- d. Canvons
- 3. Rivers can make new lands from sediments by the effect of

process.

- a. mechanical weathering
- b chemical weathering

c. deposition

d. erosion

(B) Give a reason for the following:

The sides of a canyon at the beginning of its formation are gently sloped.

(A) Put (V) or (X):

- 1. The Colored Canyon in Sinai is formed due to erosion by water for a short period of time.
- 2. There are no trees or plants grow on the both sides of a canyon at the beginning of its formation.
- 3 The walls of canyons may be eroded by the effect of a river movement.

(B) What happens if ...?

More of rain water is running through a small canyon again.

Look at the following pictures, then complete the sentences below:



Picture (A)



Picture (B)

1. Rains in picture in picture

can turn the flat land into the landform that is present

	If a lot of rain falls on the will get deeper.	ne landform in picture	, its gently sloped sides
	3. Water in picture	can gather in one str	eam and form a river.
	 Landform in picture — of its formation. 	is considered as	a small canyon at the beginning
	Section	19	DE PROPERTO LA
H	(A) Complete the follow	ing sentences using the	words below:
		(type - Sinai - V-sh	ape)
	1. Wadi Rum in Jordan h	as a	
	2. The Colored Canyon i	s found in	
	3. The shape of valley de		rocks exist in the landscape.
	(B) Give a reason for the	following:	
	•	d their houses very close	to a river.
	(A) But (<) or (Y)		
П	(A) Put (V) or (X):	ore erosion than small st	reams. (
	2. All canyons have the		(
	3. Canyons differ in colo		(
	(B) What happens if?		
		over a flat land for many	y days.
()	Choose from column (B) what suits it in column	(A):
	(A)		(B)
	Processes		vidence
	1. Weathering.		of sand after heavy rain.
	2. Erosion.	b. Formation of clouds i	
	3. Deposition	away after heavy rain	anyon where soil is washed i.
		d. Formation of rounder	d and worn small rocks.

3.

2.

1.

(A) Choose from column (B) what suits it in column (A):

(A)	(B)
1. Deltas	a. is a special type of valleys that has steep sides
2. Valley	b. are formed due to the effect of deposition process.
3. Canyon	c. is a lowland area in between mountains and has gently sloped sides.
	d are formed due to the effect of weathering process

(B) Give a reason for the following:

Canyons may be formed as a result of river streaming

(A) Correct the underlined words:

- Canyons can take hundreds of years to be formed.

 ()
- Big streams cause more deposition than small streams.
- 3. Nile River Delta has a rectangular shape.

(B) What happens if ...?

The fast flow of water eroded a lot of sediments of a mountain and carried them away for a long period of time.

Look at the following pictures, then choose the correct answer:



A valley Picture (A)



A cany in Picture (B)

- (Picture (A) Picture (B))
- 2. The landform that were eroded in mountains is present in
- (Picture (A) Picture (B))
- 3 Both landforms are created by the effect of processes.

(weathering and erosion - erosion and deposition)

(A) Choose the correct answer:

- 1. Nile River Delta is formed due to process.
 - a chemical weathering
- b mechanical weathering

c. erosion

- d. deposition
- are formed by the effect of water erosion of many sediments 2. Most and transferring them away.
 - a. deltas
- b. mountains c. valleys
- 3. Among the landforms that depend on deposition process in their formation
 - a sand dunes and deltas.
- b canyons and deltas.
- c sand dunes and valleys.
- d deltas and valleys.

(B) Give a reason for the following:

Plants that grow in the wetlands of deltas have an important role in formation of those deltas.

(A) Correct the underlined words:

Deltas are formed by weathering process.

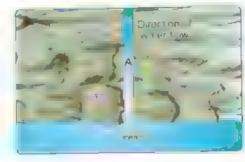
- 2. Dunes are lowland areas which have gently sloped sides.
- 3 Small canyon is formed due to the flowing of wind through the flat land.

(B) What happens if ...?

The speed of the river water decreases.

Look at the opposite figures, then answer the question below:

Do you think that a delta will form in the area A? (Give a reason for your answer)



(A) Complete the following sentences using the words below:

(decreases - erosion - increases)

- Wind in desert can change the shape of rocks by process
- 2. When a river meets a sea, the speed of river's water and may cause formation of a delta.
- 3 When the amount of rainwater ____, the sides of the canyon may get deeper.

(B) Give a reason for the following:

Sometimes we can observe sand dunes in front of large rocks of desert.

(A) Put (✓) or (X):

- 1. Dunes are special type of valleys which is formed due to wind erosion. ()
- 2. Deltas may contain fertile soil which is suitable for cultivating many crops. ()
- Canyons are formed by weathering and erosion of rocks for a long period of time.

(B) What happens to ...?

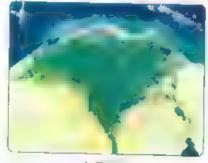
The sand in a desert when wind blows by a great force.

Complete the sentences below pictures to show how these landforms are formed by writing "Weathering process, Erosion process or Deposition process":



A Canyon

1, and processes.



A Deita

process.



A Sand dune

3. .. and

.. processes.

Model Exam

on Theme (4)



(A) Put (✓) or (X):		(5 mai	ks)
A small canyon could be formed due to the effect of water stream a flat land.	am on	()
2. Wind can be considered one of the factors that cause weather	ng.	()
The walls of valleys are vertical and steep.		()
4 The force of gravity pulls rocks down the mountain sides causir	ng		
its erosion.		()
(B) Give a reason for the following:			
People must not build their houses very close to a river.			
(A) Choose the correct answer:		(5 mai	rks)
A canyon may take of years to be formed			
a. hundreds b. tens c. millions d. couple	>		
2 All the following are processes that can change the Earth's surface,	, except		
a digestion b erosion. c. weathering d depos	ition.		
A gentle wind may carry sand for a distance, but the carry sand for a distance.	hurricane	e can	
a. long – shorter b. long – longer			
c. short – shorter d. short – longer			
4. can erode valleys and make canyons across them			
a. Rivers b. Mountains c. Dunes d. Rocks	;		
(B) Correct the underlined words:			
1. Limestone caves are formed due to the combination	,		,
of red-colored rust.	()
2 When the water of a river travels down hill on a steep slope,	,		\
its speed will decrease.	()

(A) Complete the following sentences by using the words below:

(speed – deposition – rivers – canyon)

- Both of valleys and canyons often have or streams flow through their lowest points.
- Deltas are formed when the of the river water decreases, which causes deposition of sediments.
- The plants of wetland and their roots cause increase of the rate of process.
- 4. When the sides of a valley become steep, this valley may be changed into a

(B) Complete the sentence below each picture using the following words: (Weathering – Erosion – Deposition)



Small rocks of a mountain

1. process.



Formation of new lands at river's end

2. process.



Carving of a mountain by a river stream

3. .. process.

or the your amounting.

Cho	oose the correct	answer:			
1.		urface is eroded ofprocess.	lue	to weather facto	ors, this indicates
	a. weathering	b deposition	С	transfer	d erosion
2.		s forming rocks is eathering.	b	erosion by wind	
	c deposition in r	rivers.	d	chemical weath	nering.
3.	Which of the folloprocess?	owing indicates th	e o	occurrence of che	emical weathering
	c. Trees' roots g	s inside rocks. dic water with roc row in rocks crack g with each other	(S.		r current.
4					
4.	weathering facto				
	a Expansion.	b Weathering.	¢	Erosion.	d Evaporation.
5.	When rocks brea process.	ak down into smal	l pie	eces, this indicat	es the occurrence of
	a mechanical w	eathering	b	chemical weath	nering
	c. erosion by wir	nd	d	erosion by wate	er
6.	Which of the follo	owing is an evide	nce	of erosion?	
	a Sand dunes for	ormation.	b	Forming rocks	crumbs.
	c Nile River dell	ta formation.	d	. Forming of sed	imentary rock.
7	Forming red rust process.	t in sedimentary re	ock	s is an evidence	of occurring of
	a erosion of sec	dimentary rocks	b	mechanical we	athering
	c. chemical wea	thering	d	transfer and de	posit of crumbs
8.	Steep valleys for	rmed due to flowir	ng v	water erosion are	e called
	a. canyons.	b. sand dunes.			d. deltas.
9.	The formation of	f sand dunes in E	aste	ern Desert in Eg	ypt is due to the movement
	a. floods.	b. winds.	C	waves.	d. torrents.

a. floods.

ale sea, laile	form which is called	PROFITE BY 1911	mou.
a. delta	b. sand dune	c. dam	d. canyon
Which of the water erosion	following landforms i	s steep and f	formed due to power of flowing
a. Plains,		b. Valleys.	
c. Canyons.		d. Mountai	
2. The presence are	e of sand dunes or th	ne deposits is	n a region, tells us that they
a eroded in t	their place.	b weather	red in their place.
c. eroded in a	another place.		ed and eroded in their place.
3. The following of the occurre evidence occ	ence of a geological	e of landform process. Co	s. Each of them is an evidence nnect each process with its
1. Erosion b	y water.	a.	
Erosion b Z. Deposits of		b.	

FINAL REVISION

PART



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Concept (3.1)

Scientific terms (Definitions)

Scientific terms	Definitions		
1. Energy chain :	It is a way to describe the energy flow that occurs when we use different devices.		
2. The law of conservation of energy:	Energy can neither be created nor destroyed, but only converted from one form of energy into another.		
3. Wasted energy :	It is the output energy does not help the device do the function for which it was designed.		

2 Importance or uses :

Items	Importance or uses
1. Mars rover Curiosity :	A robotic vehicle designed to explore the surface of Mars.
2. Battery inside the toys :	It converts chemical energy into electrical energy.

Give reasons for

1. A remote-controlled toy car needs a battery to move from one place to another.

Because the chemical energy stored in battery is converted into electrical energy that changes into kinetic energy that makes the car moves.

2. Some calculators use the sunlight to operate.

Because the energy of sunlight (solar energy) is converted into electrical energy which calculators use it to be operated.

Mars rover Curiosity operates for a long period of time on Mars without any need to be recharged.

Due to the presence of solar panels that use sunlight to recharge its batteries.

- 4. There is an energy change when you press the spring of a soap dispenser.
 Because the potential energy stored in its spring is converted into kinetic energy that moves the soap upward.
- When you rub your hands together, you feel warm.Because the kinetic energy is converted into thermal energy

Not all the energy that enters the energy chain completely reaches the device.

Because some of the energy is wasted in the form of heat.

- You feel heat, when you put your hands near a lighted electric lamp.
 Because some of the electrical energy is converted into thermal energy.
- 8. The presence of batteries inside a toy car.
 Because battery is the source of energy where the chemical energy is converted into electrical energy to operate the toy car.
- Thermal energy in a mobile phone is considered as a wasted energy.
 Because it doesn't help the mobile phone to do its main function.
- 10. The electrical energy that enters the hair dryer does not come out of the hair dryer in the same form of energy. Because it is converted into kinetic, thermal and sound energies.
- 11. Sound energy and thermal energy are considered as wasted energy in the blender.

Because they don't help the blender to do its main function.

4 What happens ...?

If batteries of remote-controlled toy car run out.
 The car will not move, so we can recharge its batteries by connecting toy car to a nearby charger or replacing old batteries with new ones.

- If solar calculators were exposed to the sunlight.Solar energy is converted into electrical energy that operate them.
- If Mars rover Curiosity didn't get any sunlight on Mars surface.
 It cannot be operated, because it depends on sunlight (solar energy) to recharge its batteries.
- 4.To the change of energy when you turn on the television.
 The electrical energy is converted into sound energy and light energy.
- To the change of energy when you burn a piece of wood.
 The chemical energy is converted into thermal energy and light energy.
- To the change of energy when you shake a small bell with your hand.The kinetic energy is converted into sound energy.

7. If you put your hands near the lighted lamp.

You feel warm, because some electrical energy is converted into thermal energy

8. If you use a mobile phone for a long time.(according to the wasted energy).

Some energy is wasted as thermal energy.

If you turn on an electric fan. (according to the change of energy).
 The electrical energy is converted into kinetic energy which do the main function of fan and sound energy as wasted energy.

Mein-peints?

- Most of the energy we use is produced inside the Sun.
- Batteries inside the remote-controlled toys are the resource of chemical energy, as this energy is converted into electrical energy, which is converted into kinetic energy or sound energy.
- When the batteries run out of charge, they can be recharged by connecting the device to a nearby charger or by replacing the old batteries with new ones.
- Mars rover Curiosity uses solar panels and batteries (which are charged by solar energy) as a source of energy, where:
- The solar panels on the rover convert solar energy into electrical energy, which is used to charge the rover's batteries.
- The electrical energy from the batteries powers the vehicle's sensors and the electrical energy is also converted into kinetic energy and thermal energy as the vehicle moves across Mars surface.
- Energy chains often start with the Sun.
- Some of the energy is wasted in different forms, while travelling through the energy chain, where most of the lost energy leaks out in the form of heat.
- All devices have energy coming in and out of them, where:
 The energy that comes in a device is called "input energy".
 The energy that comes out a device is called "output energy".
- Energy chains:
- 1. Energy chain when eating food :

Light energy	Converted into	Chemical energy	Converted into	Kinetic energy
(From the Sun)		(Stored inside the plant)		(Movement of the human body)

2. Energy chain when heating a pot of water over a fire :

Light energy	Converted into	Chemical energy	Converted	Thermal energy
(From the Sun)		(Stored inside the trees)		(When burning the wood of trees to heat the water inside the pot)

3. Energy chain in a hair dryer:

Light energy	Converted	Chemica energy		nverted into	Thermal energy and kinetic energy	
(From the Sun)		(In coal form from the rema of dead trees	ins		(In electric power stations)	Converted
	rmal energy, gy and sound		Converted Into	Elec	ctrical energy	6.
	(In the hair drye	or)		(Goes	through electric wires)	

4. Energy chain while riding a bike :

Chemical energy	Converted into	Kinetic energy	Converted into	Thermal energy
(In food)		(In the bike)		(Tire friction with the road)

5. Energy chain when a light bulb is switched on :

Electrical energy	Converted into	Light energy and thermal energy
(In electrical wires)		(in the light bulb)

6. Energy chain in the mobile phone :

Electrical energy	Converted into	Chemical energy	Converted into	Electrical energy
(When charging the mobile)		mobile battery)		(To operate the mobile phone)

Sound energy and light energy

(Produce from the mobile phone

REWIEW on Concept (3.2)

Scientific terms	Definitions		
1. Fuel :	It is any substance that produces thermal energy when it is burned.		
2. Biofuels :	They are fuels made from living organisms that can be planted.		
3. Fossil fuels :	They are fuels formed from the remains of plants and animals that were buried and decomposed over a long period of time.		
4. Renewable energy resource :	It is a natural material that can be replaced soon after it is used.		
5. Nonrenewable energy resource :	It is a natural material that is used faster than it can be replaced.		
6. Acid rain :	It is a type of rain that is formed when carbon dioxide gas combines with water in the air.		
7. Global warming :	It is a phenomenon in which the Earth's temperature increases, when carbon dioxide gas increases in the air.		

2 Importance or uses:

Items	Importance or uses
1. Coal and wood :	They are used in cooking food and warming.
2. Gasoline and natural gas :	They are used in generating electricity and operating all means of transportation.
3. Generator :	It converts the kinetic energy into electrical energy.
4. Grass, corn and wood chips :	They are used to make a liquid fuel.

3 Give reasons for :

The fuel is very important for different means of transportation.
 Because fuel is burned inside the engines to produce thermal energy that is changed into kinetic energy which causes the different means of transportation to move.

2. Sometimes the fuel indicator of a car goes down.

Because the fuel in the car tank runs out.

3. Gasoline is burned inside a car engine.

To produce thermal energy which changes into kinetic energy that causes the car to move.

- 4. Water and wind are considered as renewable resources of energy. Because they can be replaced shortly after being used.
- 5. Coal and gasoline are considered as nonrenewable resources of energy. Because they are used at a rate faster than they can be renewed.
- 6. Using wood of trees as a fuel has negative effects on the environment. Because continuity of cutting down trees leads to deforestation.
- 7. Generators are important in electric power stations. Because generators convert kinetic energy into electrical energy
- 8. We must turn off lights that we do not need. To conserve the electricity.
- 9. Smog of cars is very dangerous to human health. Because the smog of cars causes irritation of human's eyes and lungs.
- 10. Farmers must decrease the use of pesticides. Because pesticides cause the pollution of soil and water
- 11. Increase the burning of fossil fuel causes acid rain. Because burning fossil fuel produces carbon dioxide gas which combines with water in air forming acid rain.
- 12. Global warming occurs due to the increase of burning coal and oll. Because burning coal and oil produces carbon dioxide gas which forms a layer in atmosphere that traps heat on Earth causing rise in Earth's temperature that causes global warming.
- 13. Acid rain has a bad effect on buildings in cities. Because acid rain causes dissolving of some rocks including the rocks used for building.
- 14. Fossil fuels cannot be replaced as quickly as they are used. Because fossil fuels are formed over millions of years.
- 15. To keep the air clean, we must replace fossil fuels with renewable resources of energy.

Because when fossil fuels are burned, they release gases that cause air pollution.



- To the car fuel indicator if the amount of gasoline in a car decreases.
 The car fuel indicator will go down.
- To the car movement if fuel runs out in a car.The car movement decreases gradually until it stops.
- If people increase using the wood of trees as a source of fuel.It leads to deforestation, which causes negative effects on the environment.
- If the remains of dead living organisms were buried under the Earth's surface over millions of years.
 They are converted into fossil fuel.
- If decomposition of remains of sea animals under the Earth's surface.They will form oil and natural gas.
- 6. To a generator that is connected to a damaged turbine in an electric power station.

 Turbine cannot produce kinetic energy, so the generator will not turn and don't generate electricity.
- 7. To the movement of the turbine if the water in an electric power station is not heated.
 Water will not produce steam, so the turbine will not move and will not produce kinetic energy.
- If pesticides mix with water of canals and rivers.It causes the pollution of water and soil.
- If factories decrease their use of chemicals.The pollution of air, water and soil will decrease
- If acid rain falls on buildings for a long period of time.
 It causes dissolving of the rocks used for building.
- 11. If people decrease burning fossil fuels.
 The amount of carbon dioxide gas in air will decrease.
- 12. To the amount of fossil fuels if people don't conserve their usage.

 Fossil fuel will run out on the Earth.
- 13. To the Earth's temperature if we use renewable resources of energy instead of fossil fuels.

The Earth's temperature will not increase.



1. Biofuel and fossil fuel:

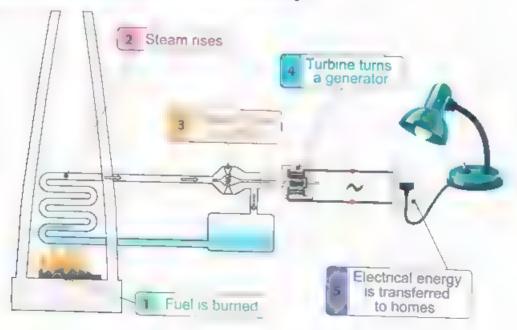
Points of comparison	Biofuel	Fossil fuel
1. Definition :	It is fuel made from Irving organisms that can be planted.	It is fuel made from the remains of plants and animals, that takes millions of years to be formed under certain conditions.
2. Renewable or nonrenewable :	Renewable.	Nonrenewable.
3. Examples:	Wood, grass and corn.	Natural gas, coal, oil and gasoline.

2. Renewable and nonrenewable resources:

Points of comparison	Renewable resource	Nonrenewable resource
1. Definition :	It is a natural material that can be replaced soon after it is used.	It is a natural material that is used faster than it can be replaced.
2. Examples:	Solar energy, water, wind energy and wood.	Coal, gasoline, oil and natural gas.

6 Important drawing :

Using fossil fuels to generate electricity :



The state of the s

 The original source of energy in biofuels and fossil fuels is the light energy of the Sun.

Formation of coal :

- 1. Millions of years ago, large areas of the Earth were covered in swamps, with a lot of plants growing nearby.
- When those plants died, their remains were decomposed and covered by hundreds of meters of mud and rocks.
- 3. Due to the effect of the Earth's heat and pressure, those remains were turned into coal.

Formation of oil:

Oil comes from deep in the ground, where oil formed from the decomposition of sea creatures, as follows:

- 1. When the marine creatures died, their remains settled on the ocean floor
- Over millions of years, layers of sediments and rocks covered the remains of those sea creatures, these layers pressed down causing extreme heat and pressure.
- Over time, as a result of extreme heat and pressure, those remains converted into oil

Some causes of pollution in big cities :

- Smog produced from burning of fuels pollutes the air.
- 2. Pesticides used in farms can be carried into water in canals and rivers when rain falls, this leads to pollution of soil and water.
- Chemicals used in many factories pollute the air and also the nearby water and soil.

Some effects of air pollution on human's health:

- Smog from cars causes irritation of human's eyes and lungs.
- Scientists have found that smog is full of small particles that the human breathes in, these particles irritate the lungs, causing the damage of tissues of the respiratory system.

Some ways to conserve fossils fuels:

- Walking or using bicycles instead of driving a car.
- 2. Turning off the lights when you are not in the room.
- Replacing fossils fuels with renewable energy resources such as water, wind and solar energy.

Burning of coal and oil produces carbon dioxide gas which causes:

1. Acid rain	2. Global warming
Carbon dioxide gas can combine with water in the air to form acid rain that leads to: The death of trees. The change in the chemical nature of lakes and kill fish. The change in the chemical nature of soil. Dissolving some rocks including the rocks used for building	Increasing the amount of carbon dioxide gas in the air forms a layer in the atmosphere that traps heat on Earth causing a slow rise in the Earth's temperature, which is known as global warming.

Review on Concept (3.3)

(Colorida Issue (Deliablica))

Scientific terms	Definitions It is a type of electrical energy generated by water turbines in dams.	
1. Hydroelectric energy (hydroelectricity) :		
2. Wind :	It is a natural movement of air that is resulted from the difference in temperatures between cold air and hot air.	
3. Water cycle:	It is the process in which the water of rivers evaporates, then condenses forming clouds and return back to rivers through rainfalls.	
4. Evaporation process :	It is a process in which water changes into water vapor.	
5. Condensation process:	It is a process in which water vapor changes into water.	

2 Importance or uses :

Items	Importance or uses	
1. Solar panels :	They generate electricity by using solar energy which is used to operate light posts in streets.	
2. Wind turbines :	They generate electricity by using the kinetic energy of wind.	
3. Water turbines :	They generate electricity by using the kinetic energy of water.	
4. Windmills :	They crushing grain to make flour.	
5. Watermills :	They crushing grain to make flour.	
6. Solar energy :	- In warming houses, by placing large windows on the walls that face the Sun for most of the day. - In greenhouses, radiant energy is converted into thermal	
	energy which warms the inside of the greenhouses. In cooking food, where convergent (concave) mirrors are used to collect and focus Sun rays to heat metal pots and cook the food inside.	
	 In heating water, where solar water heaters are made of panels that are made of black pipes can be placed on the roo of houses to heat the water 	

7. Greenhouses :	They help farmers to plant the crops that only grow in warm climate.
8. Solar water	They heat the water by using solar energy through black pipes
heaters :	on the roof of houses.

3 Give reasons for :

- Humans used windmills and watermills from hundreds of years ago.
 Because they helped them to crush grain to make flour
- Sometimes the Sun is not visible in the sky but you can feel its warmth.
 Because the atmosphere, land and water of Earth absorb the thermal energy of Sun which causes increasing in the Earth's temperature.
- 3. Some electrical devices have solar panels which are composed of many solar cells.

To absorb the solar energy coming from the Sun and convert it into electrical energy.

- 4. Kinetic energy of wind affects the speed of wind turbine blades rotation. Because by increasing kinetic energy of the wind, the blades rotate faster and wind turbine generates more electricity.
- Sometimes the wind turbines are useless.
 Because sometimes the wind doesn't blow, so their blades don't move, so wind turbines don't generate electricity.
- 6. Hydroelectric dams are built on rivers.

To control the water flow and increase the potential energy of water to generate electricity.

7. Water turbines are placed in waterfalls areas.

Because water turbines convert kinetic energy of flowing water into electrical energy.

8. Some dams contain water turbines.

Because kinetic energy of moving water in dams is used to rotate water turbines to generate hydroelectric energy.

What happen if

Wind doesn't blow in an area that contains many modern wind turbines.
 The blades of wind turbines don't move and also don't generate electricity.

2. Sunlight falls on solar panels.

The solar energy of the Sun is converted into electrical energy.

3. Sunlight falls on a greenhouse.

The greenhouse absorbs the radiant energy from the Sun and convert it into thermal energy.

4. The solar cells in a calculator are exposed to sunlight.

The solar cells absorb solar energy and convert it into electrical energy that is used to charge the battery of calculator.

- 5. The kinetic energy of a wind that is applied on the wind turbine increases. Its blades rotate faster and generate more electricity.
- There is difference in temperatures of air around Earth.It causes the movement of air and wind blowing.

7. Water turbines are placed in a dam.

Potential energy of water behind dams is converted into kinetic energy which causes water turbines rotate and generate electricity.

- 8. Potential energy of water increases behind a dam that has water turbines. It converts into more kinetic energy which causes water turbines rotate faster and generate more electricity.
- 9. Water of seas and rivers evaporates, then condenses in the atmospheric air.

Clouds are formed and rain may fall.



1. Windmills and watermills :

Points of comparison	Windmills	Watermills
Used energy :	Kinetic energy of wind.	Kinetic energy of water.
Advantages :	Low cost. Renewable energy resource.	Low cost. Renewable energy resource.
Disadvantages :	Sometimes the wind does not blow and the windmills do not move, so they are unable to do their job.	Sometimes the water source may dry up and the watermills do not move, so they are unable to do their job.

2. The use of water and the use of wind to generate electricity:

The use of water to generate electricity Differ			
It is used in places where dams are built on rivers.	It is used in places with strong winds.		
Similarities			
- Both of them are renewable energy resources.			
- Both of them use kinetic energy to operate turbines to generate electricity.			

- The energy comes from the Sun is called "soiar energy", which contains light and heat energies from the Sun.
- The solar energy that is produced by the Sun contains a type of energy called 'rad ant energy" (radiation) which is found in the Sun rays.
- Solar panels are composed of many small solar cells that capture solar energy (especially radiant energy) and convert it into electrical energy.
- Uses of electricity generated by solar panels :
 - Light the streets.
 - Recharge some types of batteries, like some calculators with small solar cells.
 - Operate various electric devices in houses.
 - Operate irrigation equipment in some villages.
- The following diagram shows the energy chain of the wind turbines:

Radiant energy	Converted nto	Thermal energy	Converted into	Kinetic energy	Converted	Electrical energy
From the Sun		between hot air an		n wind Erbines		h powerwies,

- In wind turbines, when the kinetic energy of wind increases, the blades rotate faster, so the efficiency of wind turbine increases
- · Water is used to generate electricity, as :
 - Rivers flow downhill, the gravitational potential energy of water is converted into kinetic energy that helps rotate water turbines to generate electricity.
 - Hydroelectric dams are built on rivers to control the flow of water and increase the potential energy of water to generate electricity.

Review on Concept (4.1)

1 Scientific terms (Definitions)

Scientific terms	Definitions
1. Canyons :	They are deep valleys covered by flowing water.
2. Weather :	It is the condition of atmosphere at a specific time and place.
3. Weathering :	It is the breaking down of rocks on Earth's surface into smaller (tiny) pieces.
4. Mechanical weathering :	It is the breaking down of rocks due to the effect of physical factors like wind, water, plant roots and temperature.
5. Chemical weathering :	It is the change of the structure of rocks due to chemical reactions.
6. Erosion :	It is the process in which the small particles (sediments) of sand, soil and rocks are moved to other places by wind, water and gravity.
7. Deposition :	It is the process of laying down of sediment after its erosion.

2 Give reasons for :

- Formation of canyons is considered as an example of slow changes.
 Because they are formed due to the slow changes that happened to their rocks over many years.
- Iron in rocks may rust.Due to the reaction between iron and oxygen of air.
- Water plays an important role in the formation of limestone caves.
 Because water dissolves minerals in rocks, then these dissolved minerals combine again forming new shapes.
- Formation of a delta when a river meets a sea.
 Because the sediments are deposited at the end of the river.
- Formation of sand dunes on a beach.Because they are formed by the effect of weak winds.
- Formation of large sand dunes at Western Desert.Because they are formed by the effect of strong winds

3 What happens if ...?

Sea waves hit costal rocks over a long period of time.
 The shape of costal rocks will change due to breaking down of some parts of rocks.

2. Lichens growing on rocks produce acids.

The minerals of these rocks dissolve causing their breaking down.

3. A red-colored rust is formed on some rocks.

These rocks become weak and can be break down easily.

4. A river carries sediments meet a sea.

A delta may be formed.



1. Fast changes and slow changes:

Fast changes	Slow changes
They are observed in a sandcastle which	They are observed in a coastal rocks
may completely disappear in few minutes	over time, as there may be some little
as a result of its hitting by the sea waves.	difference in its shape after many years if
	some parts break off.

2. Weather and weathering:

Weather	Weathering
It is the condition of atmosphere at a specific time and place.	It is the breaking down of rocks on Earth's surface into smaller (tiny) pieces.
 There are many factors affecting weather such as temperature, wind, rains, ect. 	There are many factors that cause weathering such as temperature, wind and water.
 The condition of weather can help us to decide what to wear when we go outside. 	Weathering can change the shape of Earth's surface over time

3 Mechanical weathering and chemical weathering :

Mechanical weathering	Chemical weathering
It is the breaking down of rocks due to the effect of physical factors like wind, water, plant roots and temperature.	It is the change of the structure of rocks due to the chemical reactions of rocks with some other materials such as oxygen, water, acid rain and acid produced by some living organisms.

4. Weak winds and strong winds:

Weak winds	Strong winds		
- They can form small sand dunes.	- They can form large sand dunes.		
Example :	Examples :		
Sand dunes on a beach.	Sand dunes in :		
	- Western Desert in Egypt.		
	- Rub' Al Khali in the Arabian Peninsula.		

5 Important drawing



Snaping the Earth









The role of temperature in mechanical weathering



Red colored rust in rocks



Limestone cave



Sand dunes in desert



- Sand is formed by breaking down of some types of rocks.
- Forces of water and wind are responsible for the disappearance of sandcastles and erosion of coasts.

Canyons:

- Canyons are formed due to the slow changes that happened to its rocks over many years.
- Canyons are formed by the action of water.
- A canyon has needle-like parts and slopes at the sides.
- Earth's surface changes through different processes such as weathering, erosion and deposition.
- You can see the effect of weathering in many observations around you such as:
 - Breaking of statues.
 - Removing of paints of buildings.
 - Pulling a wave to the sand of seashores.
- There are two types of weathering which are mechanical weathering and chemical weathering.
- In the mechanical weathering we can see the breaking down of a substance without changing of its nature.
- In the chemical weathering we can see the breaking down of a substance and formation of another substance as a result of chemical reactions.
- Erosion may be happened by the action of wind, water or gravity.
- You can see the evidence left by erosion after hundreds, thousands or millions of years from its occurrence.
- Sediments are small solid materials such as sand, soil and small particles of rocks.
- Sediments are moved by wind and water and settles on the surface of land or the bottom of water bodies such as lakes and seas.
- Action of water in deposition :

Running water in rivers play an important role in deposition process such as :

- A river can deposit a sandbar along its banks (sides).
- When a river carries sediments meet a sea, these sediments are deposited there forming a delta such as the Nile Delta.
- Sea waves also move sand from one place to another new place where it deposits there.

Rovin on Concept (4.2)



Scientific terms	Definitions
1. Canyon :	It is the landform that is formed by the effect of weathering and erosion due to wind, water or other factors.
2. Grand canyon :	It is a very large and steep canyon which is found in United States of America.
3. Valleys :	They are lowland areas in between mountains and have gently sloped sides around rivers.
4. Wind erosion :	It is the process by which the wind carves the rocks into different shapes.
5. Sand dunes :	They are landforms which are made of windblown sand when something like rock blocks the wind.

2 Give reasons for :

- Trees and other plants are growing on both sides of small canyons.
 Due to flow of water stream which is needed by plants to grow.
- 2. It might be useful to recognize signs of weathering, erosion and deposition.

 Because it may help in building houses in safe places
- 3. The sides of canyon at the beginning of its formation are gently sloped.

 Due to the help of water in eroding the sides down.
- 4. Valleys have different shapes.

Because the shape of a valley depends on several factors including :

- The types of rocks exist in the landscape.
- The speed, age and size of river that form the valley.
- 5. Canyon may be formed as a result of river streaming.
 Because the fast flow of water can erode a lot of sediment and carry them away, that lead to a formation of canyons.
- 6. Plants of wetland areas help in formation of deltas.

 Because they help in increasing the rate of deposition process.
- 7. A sand dune may be formed in front a large rock in desert.
 Because the large rock can block the path of sand which is carried by wind.

3 What happen

- To a flat land, if a water stream flows over it.
 A small canyon may be formed.
- 2. To a house that is built close to a river, if the path of the river is changed toward this house.

It causes weathering and erosion of the house.

3. To a small canyon if it rained a lot and water ran through it for a longer time.

The small canyon could get deeper.

- 4. If a river erodes the sediments of a mountain over a long period of time.

 A canyon may be formed.
- 5. If a river stream enters a sea.

 A delta may be formed.
- If the speed of the river water decreases.River drops the sediments which it is carrying forming deltas.
- If wind that is carrying sand particles hits a big rock.Sand dunes may be formed.
- 8. To the sand in a desert when wind blows by a great force. The sand travels for a long distance.



Canyons and Valleys:

Canyons -

- They are the areas that were eroded in mountains.
- Their walls are usually very high (have great depth), steep, narrow and consist of many layers of rocks.

Similarities

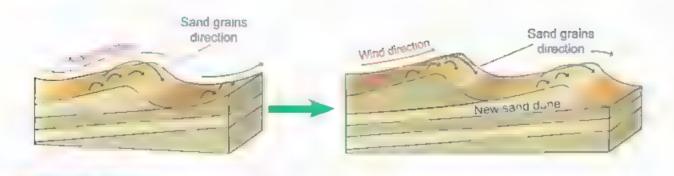
- Both of them can be formed by rivers or streams.
- Both of them often have rivers or streams flow through the lowest points.

Valleys -

- They are lowland areas in between mountains.
- They have gently sloped sides that usually surround a wide, flat plain.

5 Important grawing.

Sand dunes movement:



- A canyon can be formed in many ways, such as weathering and erosion due to wind, water and other factors.
- · Canyons can take millions of years to form.
- Canyons differ in their colors, texture and shape of rocks, where:

 - 2. Canyons can have white as in colored canyons in Sinai and Wadi Rum canyon in Jordan.
- Canyons are special types of valleys that their sides are steep.
- The shape of the valley depends upon several factors as:
 - The types of rocks present in this landscape.
 - The speed, age and size of the river in this landscape
 - Grand Canyon is an example of canyon that is found in the United States of America, and it is very large and steep, contains many layers of rocks.
 - Big streams or rivers cause more erosion than small streams.
 - Rivers that flow fast cause more erosion than rivers with slow flow.
- Deltas are formed by the process of deposition.
- Most deltas are formed in two cases, where flowing water enters still water (immovable water) or slower moving water. And this two cases could be :
 - A river stream enters a lake. A large river stream enters sea of ocean.
- From the most famous deltas in the world is the Nile River Delta.
- Large wetlands are formed in deltas.

- Plants that grow in the wetlands found in deltas increase deposition process because:
 - 1. Plants are partly responsible for slowing down the river water.
 - 2. Roots of plants help in trapping sediments.
- Some landforms are created due to ⊢ ¬ ¬ and d⊢ r ¬ t on processes by wind and sand at the same time as sand dunes.
- The sand dunes usually seen in . _____, and they may cover a large area.
- The sand dunes can be hundreds of meters tall.
- Sand dunes are common landforms between t and sandy desert.
- The wind moves the sand where:
 - The distance that the sand travels depends on the time of the wind.
 - The Arry the sand moves depends on the control of the wind.
- The sand dunes often formed when something blocked the path of the sand, such as rocks.



- El-Moasser Final Examination Models.
- Final Examinations of some Governorates.





El-Moasser Final Examination Models

Model Exam

(A) Choose the correct answer: 1. The on the rover Curiosity convert solar energy into which is used to charge its batteries. a solar panels — electrical b. batteries — electrical c. solar panels — sound d. batteries — sound 2. Sand is formed due to breaking down of a. glass. b. wood. c. rocks. d. plastic. 3. Among forms of fuel that present in car fuel stations are . a. gasoline and wood. b natural gas and coal. c wood and coal. d gasoline and natural gas. 4. All of the following are examples of renewable energy resources, except a. fossil fuel. b waterfalls. c wind. d sunlight. (B) What happens if? Lichens growing on rocks produce acids. 2. (A) Put (<) or (x): 1. You need gasoline to move a bicycle. 2. A solar panel consists of one small solar cell. 3. Most of energy chains start with the moon. 4. We cannot create a new form of energy, and also we cannot destroy an existed form of energy. (B) Correct the underlined word: 1. Deltas are formed by weathering process. 2. Dunes are lowland areas which have gently sloped sides. (A) Write the scientific term of each of the following:
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Deltas are formed by weathering process. Dunes are lowland areas which have gently sloped sides.
Dunes are lowland areas which have gently sloped sides.
(A) Write the scientific term of each of the following:
the following :
1 A device used to convert electrical extension in the
A device used to convert electrical energy into light energy. Natural resources of apparatuments to be a selected as a
Natural resources of energy, that take a short period of time to be renewed.
A natural movement of air that results from the difference
in temperature between cold air and hot air.
4. The energy produced from a battery.
(B) Give a reason for the following:
We must turn off lights that are not needed for a while

(A) Choose the correct answer:

Model Exam 2

1. The	input energy	when using the h	air dryer is the	energy	1.	
a. ele	ectrical	b. potential	c. kinetic	d. then	mal	
	steps of form	ning fossil fuel, do	n't include	of the rema	ins of the livi	ng
_		b cooling	c. burying	d heat	ting	
3 Foss	il fuels need	to be form	med under the E	arth's surface		
a. fiv	e years		b. ten years			
c. hu	indreds of ye	ars	d. millions of	years		
4. Wate	er flows throu	igh turbines in dai	ms to generate	energy	<i>\.</i>	
a. ei	ectrical	b. potential	c. solar	d. light		
	e a reason to inside rocks	or the following: may rust.				
(A) Cor	mplete the fo	ollowing sentence	es :	_		_
1. Both year	s ago.	are used	to grind grains t	to make flour	hundreds of	
2. In ar	ny energy cha	ain, some of the e	nergy is lost in the	ne form of		
	nd and nples of foss	are examples o il fuel.	f biofuel, while	and	are	
4. Whe	en you ride a ener	bicycle, the gy which causes	energy stored the bicycle to mo	-	is converted	
(B) Wh	at happens i	f?				
Arı	ver erodes th	ne sediments of a	mountain over a	long period o	of time.	
[] (A) Co	rract the unc	derlined words:				
		of a river travels d	lownhill on a stee	ep slope,		
	peed decrea				()
		steep slope.			(,)
3 Afte	r death of liv	ing organisms, the	eir remains are b o extreme pressi	uried under are and cool.	(.)
		is usually followe			()
4. Ero	sion process	is usually follower	d by woodinging	1	1	

(B) Look at the following figures, then put $(\sqrt{})$ or (x):







		Car (2)
1.	The movement of the two cars can	be controlled from a distance by using
	a remote control.	and the of doing

2.	Саг	(2)	uses	sunlight	to	move.
----	-----	-----	------	----------	----	-------

Model Exam 3

(A) Choose the correct answer:

- 1. All the following are processes that can change the Earth's surface, except .
 - a. digestion.
- b erosion.
- c. weathering.
- d deposition.

- 2. Electric wires are made of
 - a. copper.
- b. carbon.
- c. wood.
- d. glass.
- 3. All the following are forms of fuel, except
 - a. wood.
- b. natural gas.
- c. gasoline.
- d. glass.

- 4. The Sun provides us with and
 - a. sound heat.

b. light - electricity.

c. sound - light.

d. heat - light.

(B) Give a reason for the following:

The used amount of fossil fuel cannot be replaced as quickly as it is consumed.

2 (A)	Correct the	underlined	words	

- Curiosity is a robotic vehicle that is designed to explore the surface of moon.
- 2. Hydroelectric energy, is one of nonrenewable energy resources.
- 3 Small solar panels are used to supply one light bulb with sound energy.
- 4. Toy cars depend on fuel as a source of electrical energy.
- (B) What happens if ...?

You turn on an electric fan.

(according to the change of energy)

(A) Choose from column (B) what suits it in column (A):

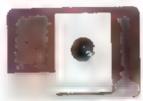
(A)	(B)
1. Water	a. needs extreme heat and pressure to be formed from
2. Wind energy	remains of dead plants.
3. Coal	b. is the main resource of energy of the Earth's surface.
4 The Sun	c. is a gaseous renewable resource of energy.
T 1110 0411	d. is a liquid renewable resource of energy.
	e. is a solid renewable resource of energy.

(B) Look at the following figures, then complete the following sentences:









Device (1)

Device (2)

Device (3)

Device (4)

The electrical energy used to operate devices number and

Kinetic energy is produced in devices function.

and

to do their main



(A) Choose the correct answer:

- 1. All the following are renewable energy resources, except
 - a. waterfalls.
- b. coal.
- c. the Sun.
- d. wind.
- 2. Hydroelectric energy is generated from
 - a. waterfalls only.

b. waterfalls and dams.

c. biofuel only.

- d. biofuel and fossil fuel.
- 3. Both hair dryer and electrical water kettle produce
- energy.

- a. chemical b thermal
- c electrical
- d potential

- 4. Some electric devices need
- energy to be recharged.

- a. electrical
- b. thermal
- c. potential
- d. sound

(B) Give a reason for the following:

Plants of wetland areas help in formation of deltas.

	FINAL	EXAM	MAT	ION
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2	(A) Write the scientific term of each of the following:	
	1 A process in which water changes into water vapor.	(
	2. The liquid that stores chemical energy, and it is used to move car	S.
		(
	3. A fuel that is produced from remains of dead animals and plants	
	under the Earth's surface.	(
	4. It is a device that produces light from electricity.	(
	(B) What happens if?	
	The charge of batteries of remote controlled toy car is running or	ut

į	(A) Put (V) or (X):		
	1. Wind can pick up sand grains during the formation of sand dunes	()
	2. Water can cause the two types of weathering.	(1
	3. Deposition process never change the shape of the land.	()
	4. Sand travels for a short distance when wind blows with a great force.	()
		,	,

(B) Complete the following table:

	Used energy	Produced energy
1. Solar panels	energy	Light energy andenergy
2. Wind turbines	energy	energy

Media Lium 5

4	(A) Choose the	correct answer:				
	1. When you us	e the hand bell, the	e energy cha	anges into sound e	nergy.	
	a. light	b. thermal	c. kinetic	d. electrical		
	2 Using conver	gent shee	ts in cooking food is	one of the benefits	of using	J
	the solar ene	ergy.				
	a. paper	b. plastic	с. тіпог	d. wooden		
	3. River water e	evaporates by the h	nelp of heat produce	d from		
	a. kettles.		b. the Sun.			
	c. electric he		d. electric iron.			
	4. Extreme hea	t and pressure und	er the Earth's surfac	e has an importan	t role in	
	forming ,		- #U #4	d biofical		
	a, wood.	b. wind.	c. fossil fuel.	d. biofuel.		
	(B) What happe	ens to?				
	The car fuel	indicator if the am	ount of gasoline in a	car decreases.		
E	(A) Put (V) or (X): are formed by eros	sion only.		()
	2. There is a st	ored chemical ener	rgy inside the food w	ve eat	()
	3. Machines ma	ake our life more e	asier.		{)
	4. We have to	conserve all forms	of fuel.		()
	(B) Give a reas	on for the followin	ig:			
			in the formation of li	mestone caves.		
					_	
		he following sente				
	1. When we ex	pose our bodies to				
	2. The energy	04.1.20	n one form to anoth			
		are mixed with the ring of oceans and late	emains of plants and kes.	d forming l	ayers	
	4. Blowing of s	trong in the	e desert may form la	arge sand dunes.		

(B) If the two wind turbines in front of you are affected by the different wind forces. Answer the following questions:



Strong wind Wind turbine (B)

- 1. Which wind turbine spins faster ? (Give a reason for your answer).
- 2. Which wind turbine generates less electrical energy?



- (A) Choose the correct answer:
 - 1. When a river meets a sea or an ocean, a landform known as is formed.
 - a. canvon
- b. volcano
- c. mountain
- d. delta
- 2. Oil is a nonrenewable energy resource that is used inside
 - a flash light.

- b. car engine c electric fan. d. washing machine.
- 3. It takes several
- for a spacecraft to travel from Earth to Mars.
- a. seconds
- b. minutes
- c. days
- d. months
- 4. You feel warm when you rub your hands together, because energy changes into thermal energy.
 - a. kinetic
- b. light
- c. electrical
- d. sound

(B) What happens if ...?

Sea creatures were buried under the Earth's surface over millions of years.

- (A) Correct the underlined words:
 - 1. Water turbines generate electricity by using the energy of wind movement.

2.	Moon	is	the	main	source	of	energy	on	Earth.
----	------	----	-----	------	--------	----	--------	----	--------

- We need sound energy that comes from the Sun, for cooking foods and warming houses.
- 4. Fossil fuels include oil, coal and wood. ()
- (B) Give a reason for the following:

Biofuel is considered as a renewable fuel.

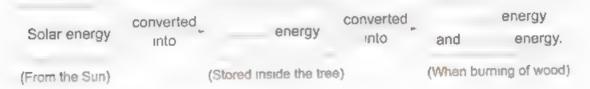
(A) Put (V) or (X):

- Both canyons and valleys often have river in their bottom
- 2. The walls of valleys are vertical and steep. ()
- 3. Deltas are formed as a result of silt deposition. ()
- 4. The Nile River Delta was formed by weathering and erosion processes only.

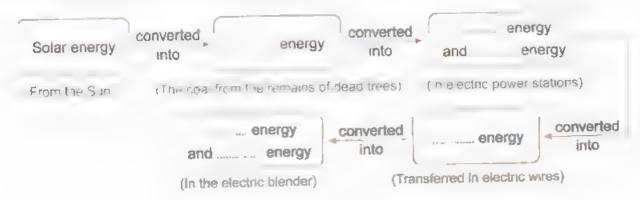
 ()
- (B) Use the following words to complete the energy chains below. (you may use the same word more than once):

(Thermal - Chemical - Kinetic - Electrical - Sound - Light)

1. The energy chain of burning some branches of a tree :



2. The energy chain of electric blender:



Model Exam 7

	Z-ACTIO				
(A) Choose the correct answer:					
1. All the following can be done by the	he effect of solar energy, excep	ot			
a. warming houses.					
b. cooking food.					
 c. producing sound from a hand b 	pell.				
d. producing light in a light post.					
2 Sound and energies are mobile phone.	from output energies when ope	erating the			
a. electrical b. potential	c. chemical d. light				
We can use the energy obtained following situations, except	from burning of wood directly in	n all of the			
a. warming houses.	b. operating television.				
c. cooking food.	d. boiling water.				
When land and water areas on Ea Earth increases.	arth absorb the solar energy, th	ne on			
a. temperature	b. water				
c. rocks	d. ice				
(B) What happens if?					
The kinetic energy of wind applie	ed to the wind turbines decreas	es.			
(A) Write the scientific term of each	of the following :				
 A type of mirrors that is used to di heat them and cook the food insid 	rect sunlight onto metal pots to le.	()			
It is a form of biofuel, that can be is such as grass and wood chips.	ts				
3 A turbine that converts the energy electrical energy.	of flowing or falling water into	()			
**	of andi	()			
4 The process in which laying down		()			
(B) Give a reason for the following:					

Some calculators use solar panels to be operated.

3	(A) From your understanding of how electricity is generated in electric power	ŗ
	stations. Put each of the following words in front of its suitable sentence	-

(Coal - Steam - Turbine - Generator)

Its movement produces kinetic energy.	()
It changes kinetic energy into electrical energy.	()
3. It is a type of nonrenewable resources of energy	()
4 It results from heating the water and it turns turbines.	()

- (B) Look at the opposite picture, then complete the following sentences.
- 1. The name of this glass building is
- The idea of working of this building depends on collecting the energy coming from the Sun.
- The received energy is converted into
 energy that warms the inside of this building.
- In the cold regions, this building allows farmers to plant crops that only grow in climates.



Model Exam 8

(A) Choose the correct answer:

- Some kinetic energy is converted into energy due to friction of bike's tires with the road.
 - a. light
- b. electrical
- c. potential
- d. thermal

- 2. Lichens produce
- on rocks that dissolve minerals found in these rocks.

- a. oxygen
- b. acids
- c. water
- d. rain
- 3. Inside the electric power station, heating of
- produces steam.

- a. turbines
- b. generators
- c. water
- d. fuel

- 4. While playing guitar, the
- energy changes into sound energy.

- a. kinetic
- b. light
- c. chemical
- d. potential

(B) Give a reason for the following:

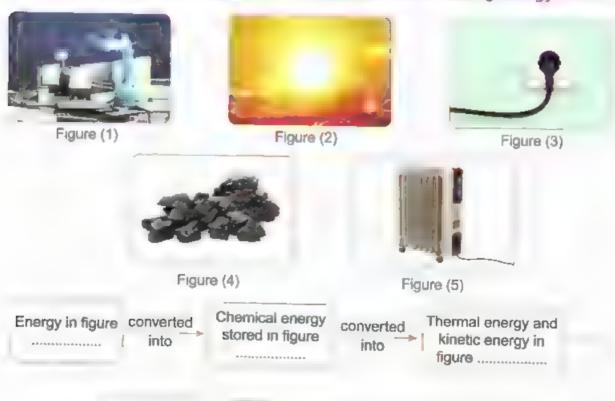
When you press on the spring of soap dispenser, the soap moves upward.

(according to the change of energy)

- (A) complete the following sentences:
 - 1 There are two types of weathering which are weathering and weathering.
 - Dams control the flow of ______, that causes the increase of the energy of water.
 - 3. In some villages, solar panels are used to generate energy that is used to operate equipment.
 - 4. Types of weathering are weathering and weathering.
 - (B) What happens if ...?
 You turn on the TV.

(according to the change of energy)

- (A) Give one example for each of the following:
 - 1. A renewable resource of energy:
 - 2. A nonrenewable resource of energy : ...
 - 3. A method of conserving fossil fuel:
 - 4. A disadvantage of using fossil fuel in energy production .
 - (B) Look at the following figures, then complete the following energy chain:



(A) Choose the correct answer:

Model Exam 9

1	. The output en	ergy when playin	g drums is the	energy		
	a, chemical	b. light	c. sound	d. potential		
2	. If the rain falls	over a canyon fo	or several times per y	ear,		
	a. its depth inc	creases.	b. its depth decr	eases.		
	c. it becomes	flat.	d. it is not affect	ed.		
3	. When the blad	des of wind turbin	e rotate, this causes	the turbine to re	tate and	
	generates	energy.				
	a, electrical	b. solar	c. chemical	d. potential		
4	All the following	ng are forms of fo	ssil fuel, except			
	a, water.	b. coal.	c. natural gas.	d. oil.		
(B) What happer	ns if?				
			er station is damage	d.		
	_		-			
<u></u>	A) Put (//) or (/	():				
			de different devices.		()
2			nto fine powder has t	he same effect (of ,	,
		eathering of rock			etential (,
3		nt of a generator	in electric power stat	ions produces p	Otermai	1
	energy.	e n = -st. 2- 12	in the ellipse		(1
		of oil on Earth is li			,	
			ach of the following			,
			roken down into sma)
2			en rocks move from a	place to anothe	er 	\
	by the help of	f wind or water.		(.		
	(A) Complete th	ne following sent	rences :	•		
			king down of some ty	pes of		
	2 The time of w	reathering in which	ch the rocks are broke	en down due to	the prese	nce
		is known as				
	51 p.=111114					

- 3. The change of electrical energy into sound energy in the radio is an example that proves the law of
- 4. The natural resources that can be replaced shortly after being used are called resources of energy.
- (B) Mention the input and output energies of the opposite device :
- Input energy :
- 2. Output energy : ,.....



Model Exam 10

(A) Choose the correct answer:

- Which of the following is a renewable energy resource?
 - a. Running bicycle.
- b. Running car.
- c. Running water.

- d. Running person.
- 2. Curiosity rover is designed to explore
 - a Earth planet. b Mars planet. c. the Sun.
- d, the moon.

- a wind turbine.
- 3. The change of energy in an is opposite to the change of energy in

 - a, electric bell b, electric heater c electric iron d electric fan
- 4. All the following factors play an important role in the formation of fossil fuel, except
 - a. extreme pressure.
- b. extreme heat

c. the moon light.

- d. rocks and sediment.
- (B) Give a reason for the following:

Coal is considered as a nonrenewable energy resource.

2	(A) Write	the scientific	term of	each of	the	following	
						Tonothing	*

- 1. The matter that produces steam on heating, which is used to tu turbines in electric power station.
- 2. A mill that is turned by water flow.
- 3. A process in which the sediments are dropped in a new location by the action of wind, water, ice and gravity.
- The change of the structure of rocks due to chemical reactions.

Im			
	(*****)
	() = v p)
ጉ			
	()
	(1

(B) What happens if ...?

You put your hands near the lighted lamp.

	4	(A)	Correct	the	underlined	words	
--	---	-----	---------	-----	------------	-------	--

- The amount of biofuel that is consumed, cannot be replaced as quickly as it is used.

 ()
- 2 Dams are built on rivers in order to generate solar energy ()
- 3. The origin of sand is the breaking down of some types of glass. ()
- 4. Plant roots help in the formation of rocks.
- (B) Look at these electric devices, then complete the following sentences:



Device (1)



Device (2)



Device (3)

- 1 Sound and light energies are produced in the device number and help it to do its function.
- Noise from devices number and is wasted energy, because sound doesn't help the devices do their functions.



Final Examinations

of some governorates

2023

i. By rubbing hands	energy	is changed into the	emal aparau
a. chemical	kinetic	c. sound	
2. is a type of			d. potential
		c. Charcoal	el Metro-tro
3 causes me			d. Natural ga
a. Oxygen b			d. Wind
4. When a rock blocks the			
	. river	c. valley	may be formed.
(B) Give a reason for the fo		o. valley	d. canyon
Wood is considered as			
100000000000000000000000000000000000000	u 1001.		
(A) Dut (a) == (a) =			
(A) Put (✓) or (x):			
1. Chemical energy is the e	nergy that sto	red in food and batte	erv. (
1. Chemical energy is the e	nergy that stor	red in food and batte	ery. (
 Chemical energy is the e Electricity can be genera 	ted from water	ī.	(
 Chemical energy is the e Electricity can be genera The watermills convert el 	ted from water ectrical energy	r. y into kinetic enerav	(
 Chemical energy is the e Electricity can be genera The watermills convert el The Earth's surface neve 	ted from water ectrical energy	r. y into kinetic enerav	(
 Chemical energy is the e Electricity can be genera The watermills convert el The Earth's surface neve What will happen? 	ted from water ectrical energy	r. y into kinetic enerav	(
 Chemical energy is the e Electricity can be genera The watermills convert el The Earth's surface neve 	ted from water ectrical energy	r. y into kinetic energy er time.	(
 Chemical energy is the e Electricity can be genera The watermills convert el The Earth's surface neve What will happen? On shaking a hand bell. 	ted from water ectrical energy or changes over	r. y into kinetic energy er time. (according to t	(
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B)	ted from water ectrical energy or changes over	r. y into kinetic energy er time. (according to t	(
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B)	ted from water ectrical energy or changes over	r. y into kinetic energy er time. (according to t	(
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B)	ted from water ectrical energy r changes ove	r. y into kinetic energy er time. (according to t in column (A) :	(
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B)	what suits it a. is the abi	into kinetic energy or time. (according to to in column (A): (B) (according to to the column (B)	he change of ene
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B) (A) 1. Canyons	what suits it a. is the abi b. are natur period of	r. y into kinetic energy or time. (according to to in column (A): (B) ility to do work. ral resources of energy	he change of ene
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B) (A) 1. Canyons 2. Weathering 3. Nonrenewable resources	a. is the abi	into kinetic energy or time. (according to the incolumn (A): (B) (B) (according to the incolumn (B): (B)	he change of ene
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B) (A) 1. Canyons 2. Weathering	a. is the abi b. are natur period of c. is the bre particles.	into kinetic energy or time. (according to the introdumn (A): (B) (B) (all resources of energy or time to be renewed eaking down of large	rgy that take long
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B) (A) 1. Canyons 2. Weathering 3. Nonrenewable resources 4. Energy	a. is the abi b. are natur period of c. is the bre particles.	into kinetic energy or time. (according to the incolumn (A): (B) (B) (according to the incolumn (B): (B)	rgy that take long
1. Chemical energy is the e 2. Electricity can be genera 3. The watermills convert el 4. The Earth's surface neve (B) What will happen? On shaking a hand bell. (A) Choose from column (B) (A) 1. Canyons 2. Weathering 3. Nonrenewable resources	a. is the abi b. are natur period of c. is the bre particles.	into kinetic energy or time. (according to the introdumn (A): (B) (B) (all resources of energy or time to be renewed eaking down of large	rgy that take long

		El Nozha Educ	ational Zolle	
	ion – weathering prod		l energy)	
	gy that produced from enewable source of e			
3. When rocks break	down into small pieces	s, this indicates the oc	currence	
of L Nile River Delta in	Egypt is formed due t	o proce	SS.	
B) Give a reason for				
Iron in rocks may				
(A) Put (V) or (X):		(t		(
1. There is a stored of	chemical energy inside	e the food we eat.	enerav	(
2 In wind turbines, th	ne kinetic energy is co	onverted into chemica	ance	1
	urricanes carry sand ause erosion of beach		ance	(
	nergy when you turn o	n the television.		
The change of er				
The change of er	nergy when you turn o			
The change of er (A) Choose from col	umn (B) what suits it	in column (A): (B) extreme heat and pre	essure to be	-
The change of er (A) Choose from col (A) 1 Water 2. Wind energy	umn (B) what suits it a it needs	in column (A):	plants.	
The change of er (A) Choose from col (A) 1 Water	umn (B) what suits it a it needs formed to b it is the surface.	in column (A): (B) extreme heat and prefrom remains of dead main source of energ	plants. y on the Ear	th's
The change of er (A) Choose from col (A) 1 Water 2. Wind energy	a it needs formed to b it is the surface.	in column (A): (B) extreme heat and prefrom remains of dead main source of energeseous renewable res	plants. y on the Ear ource of ene	th's ergy.
(A) Choose from colo (A) 1 Water 2. Wind energy 3. Coal	a it needs formed to b it is the surface.	in column (A): (B) extreme heat and prefrom remains of dead main source of energy aseous renewable resource of energy and renewable resource.	plants. y on the Ear ource of energy	th's ergy.
(A) Choose from colo (A) 1 Water 2. Wind energy 3. Coal 4 The Sun	a it needs formed to b it is the surface. c it is a ga d it is a lice.	in column (A): (B) extreme heat and prefrom remains of dead main source of energy aseous renewable resourced in the column of	plants. y on the Ear ource of ene	th's ergy.
(A) Choose from colo (A) 1 Water 2. Wind energy 3. Coal 4 The Sun	a it needs formed to b it is the surface. c it is a ga	in column (A): (B) extreme heat and prefrom remains of dead main source of energy aseous renewable resourced in the column of	plants. y on the Ear cource of energy 4.	th's ergy.
(A) Choose from color (A) 1 Water 2. Wind energy 3. Coal 4 The Sun (B) Complete the form	a it needs formed to b it is the surface. c it is a ga d it is a lice.	in column (A): (B) extreme heat and prefrom remains of dead main source of energy aseous renewable resourced in the column of	plants. y on the Ear cource of energy 4.	th's ergy. y
(A) Choose from colon (A) 1 Water 2. Wind energy 3. Coal 4 The Sun	a it needs formed to b it is the surface. c it is a ga d it is a lice.	in column (A): (B) extreme heat and prefrom remains of dead main source of energy aseous renewable resourced in the hair dryer.	plants. y on the Ear cource of energy 4.	th's ergy. y

Heliopolis Edu	cational Zone
(A) Choose the correct answer:	
1. Which of the following is from causes of mechanical weather	ing?
a. Heat. b. Acid. c. Lichens.	d. Oxygen.
2. The presence of the deposits in a region, tell us that they are)
a. eroded in their place.	
b. eroded in another place.	
c. weathered in their place.	
d. weathered and eroded in their place.	
Energy is not destroy, nor create from nothing, this indicates	
a. destroying the energy resources.	
b. the consumer of energy resources.	
c. resources of energy are numerous.	
d. conservation and transformation of energy.	
 We can decrease the consumption of fossil fuel by using all t except 	he following
a. energy produced from Sun.	
 b. energy produced from wind turbines. 	
 c. energy produced from burning gasoline. 	
d. energy produced from water turbines.	
(B) As you have learned, canyons and valleys can be formed in as weathering and erosion, both of them have characteristic	S.
Mention two factors which determine the shape of a for	med valley?
1	
(A) Put (V) or (X) in front of the statement:	
 Green plants are one of the nonrenewable resources of energy 	gv. ('
Sand dunes are created by erosion and weathering processe	s at
the same time.	()
Canyons are special types of valleys that have steep sides.	(
Wind, oil and natural gas are natural resources used to gener energy.	ate clean

energy

Turbines

(B) Complete the following energy chain :

Converted into

Potential

energy

Waterfalis

[83]

2.

energy

In wire

Converted into

(A) Choose the correct answer:

- Which of the following energy form is not produced from the Sun?
 (Kinetic energy Radiation energy)
- Formation of red rust in some rock is an evidence of occurring process.

(mechanical weathering - chemical weathering)

- 3. The produced energy from radio that reflects its main function is (electric energy sound energy)
- 4. Which of the following landforms is steeped and formed due to the power of flowing water erosion

(canyons - mountains)

(B) Water is one of the factors that causes weathering explain the results as shown in table:

	Mechanical weathering	Chemical weathering
Effect of water factor :		
illect of water factor.		

	Cairo Gove	rnorate	El Waily Edi	ucational Zone
🚺 (A) Cor	nplete the followi	ing sentences usi	ng the words belo	w:
		(wind - chang	ed - hot - coal)	
1. Foss	il fuel includes oil,	and	natural gas.	
2 Whe	n we expose our t	odies to the Sun	we feel	
3. The	energy can be	from or	e form to another.	
4. Blow	ing of strong	in the de	sert may form larg	e sand dunes.
(B) Cor	rect the underline			
Mod	on is the main sou	rce of energy on t	he Earth.	(
[] (A) Cho	ose the correct a	nswer :		
	d is formed due to			
a. gla	ass.	b. wood.	c. rocks.	d. plastic.
2. All the		amples of the ren	ewable energy res	
a. fos	ssil fuel.	b. wind,	c. sunlight,	d. waterfalls.
	energy when usin		_	
	ectrical	b. potential		d. kinetic
4. All the	e following are propt			of Earth's surface,
a. we	eathering.	b digestion.	c. erosion.	d. deposition.
	ss out the odd wo			
AAOC	od – Coal – Oil – N	latural gas.		(
📴 (A) Put	(✓) or (X):			
1. Energ	gy may be destroy	ed inside differen	t devices	(
2 Both	valleys and canyo	no often have div		,

	as an asset of the state of the	(-)
2.	Both valleys and canyons often have river in their bottom.	()
3.	The Nile River Delta was formed by weathering and erosion	`	,
	processes only.	()
4.	We have to conserve all forms of fuel.	ì	í
-	3 and	1	-/

(B) What happens ...? On turning an electric lamp.

(according to changing in energy)

5			Dokki Educati	ional Zone	
(A)	Choose the correct a	nswer :			
1. In	the washing machin		energy is converted	into kinetic and	
	thermal	b. electrical	c, light	d. potential	
	xtreme heat and pre	ssure under the l	Earth's surface has an	important role in	
a	wood.	b. fossil fuel.	c. wind.	d. biofuel.	
3. S	and is formed due to	breaking down	of		
	plastic.	b. glass.		d. wood.	
	ater turbines can ge nergy of water that is		ctricity by increasing the lams.		
а	light	b. sound	c. thermal	d. potential	
(B) \	What happens to?	?			
4 1	The car movement if		a car.		
1. G	Put () or (x) : bravity doesn't affect nountains.	the small rocks t	hat have been broken o	down from)
		is burned, therm	al energy is produced.	()
	/ind can pick up san			()
4. A	toy car can continue	moving even af	fter its battery runs out.	()
	Write the scientific t				
	The energy produced			()
	_			words :	
(A)	Complete the follow	ing statements	by using the following	tential)	
			ver – temperature – pot on Earth an		
	Blobal warming cause s climate.				
t	Vhen the urbine blades will inc	rease.	d increases, the speed		
	he process in which		n down into smaller par		
	/alleys and canyons		flow through th	eir lowest points	
	Cross out the odd w				

Solar water heater - Hand mixer - Solar panel - Greenhouse. (

1 The cutout anals	ect answer:	A	
a. electrical	when using the hair		energy.
	b. potential	c. light	d. thermal
a. electrical	turbines in dams to		energy.
	b. potential are examples of rene	c. solar ewable energy res	d. light sources.
except			
a. fossil fuel.	b. waterfalls.	c. wind.	d. sunlight.
4. Sand is formed du	e to breaking down o	f	3
a. glass.	b. wood.	c. rocks.	d. plastic.
(B) What happens if	?		
You turn on the T	V.	(according to	the change of er
3. The movement of	themical energy inside a generator in electric	power stations p	roduces
potential energy. 1. Both sandcastles a B) Cross out the ode Gasoline – Coal –	Natural gas - Wind.		's. (
potential energy. Both sandcastles a B) Cross out the odd Gasoline – Coal – A) Choose from colu	word:	n column (A) :	,
potential energy. Both sandcastles at B) Cross out the odd Gasoline – Coal – A) Choose from colu	word: Natural gas – Wind. Imn (B) what suits it i	n column (A) :	()*************************************
potential energy. Both sandcastles at B) Cross out the odd Gasoline – Coal – A) Choose from colu (A) Water	word: Natural gas – Wind. Imn (B) what suits it i	n column (A) :	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
potential energy. Both sandcastles a B) Cross out the odd Gasoline – Coal – A) Choose from colu (A) 1 Water 2. Charcoal	word: Natural gas – Wind. mn (B) what suits it i a. generate elections of the control of the con	n column (A) : (B) ricity by using the	kinetic energy of
potential energy. Both sandcastles at B) Cross out the odd Gasoline – Coal – A) Choose from column (A) (A)	word: Natural gas – Wind. Imn (B) what suits it i	(B) ricity by using the lewable resource at is formed due to	kinetic energy of of energy.

7		Middle of Alex. I	Educational Zone
(A) Put (V) in front o	f the correct sentence	es and (x) in front of	the wrong ones:
1. Floods are one of t	he factors that causes	s water erosion	()
2. Most energy chain	s start with the moon.		()
3 Deposition process	s never change the sh	ape of the land.	()
4. Both canyons and	valleys often have rive	er in their bottom	()
(B) What happens wh	en?		
A river carries sec	liments meets a sea.		
(A) Complete the following	lowing sentences:		
		sound - electricity)	
1. In hand bell, kineti	c energy is converted	into ene	ergy.
2. Fuel is used as a s	source of	energy.	
3. The shape of coas	tal rocks is affected b	y the force of	and wind.
4. When the windmill generating	blades rotates, this c	ause wind turbines ro	otate
(B) Cross out the odd	l word :		
Solar water heate	er – Hand mixer – Sol	ar panel – Greenhous	se. ()
(A) Choose the corre	ct answer :		
	e to breaking down of	***********	
a. glass.	b. wood.	c. rocks.	d. plastic.
2. When a rock block	s the path of flying sa	and, a m	ay be formed.
a. dune	b. river	c. valley	d. canyon
3. The formation of o	anyons takes	m m m m m d かかゆヤヤ	
a. few days.	b few weeks	c. many weeks	d. many years.
4. Wood is considered	ed as)
a biofuel.	b. fossil fuel.	c liquid fuel.	d. gaseous fuel.
(B) Correct the unde			
Small sand dune	s are formed due to s	trong wind.	()

	and the survey of	Galyouola E	ducational Zo	116
(A) Choose the co	rrect answer:			
1. is	the main source of ene	ergy on the Earth's s	urface	
a. Oil	b. Gasoline	c. The Sun	d. The m	oon
In water turbine energy.	es ,the ene	ergy of water is char	nged into elec	trica
a. light	b. kinetic	c. thermal	d. potent	ial
3. From examples	of renewable resource	es of energy is		
a. oil.	b. wind.	c. coal.	d. natura	l ga
4. m	ay cause chemical wea	athering or mechanic	cal weathering].
a. Oxygen	b. Water	c. Rocks	d. Licher	ıs
(B) Cross out the	odd word of the follow	/ing :		
	Photosynthesis – Depo		(
(A) Put (V) or (X)				
		ha farmed		
	ake millions of years to			(
	chains start with the me			(
	ned from decomposition		ent plants.	(
4. Biofuels are fro	m nonrenewable resou	rces of energy.		(
(B) Write the scien	ntific term of each of th	he following:		
The kind of we	eathering that changes t	the structure and co	lor of rocks	
			(
(A) Choose from o	column (B) what suits it	t in column (A) ·		
(A)		(B)		
1 Greenhouse	a are used to gene	rate electricity from	colar operau	
0 Mallan	b. usually has a tria		aciai energy	
valley	The state of the	- ·		
2. Valley 3. Delta	c. has gently sloped			
	d it helps to grow or		1 Warm climate	
3. Delta		rops that only grow in 3.	warm climate	9

House Contra		Menoufia Ed	ducational Zone
(A) Choose the correct answ	rer :		
1. The wasted energy that pr		the electric lamp is	energ
	chemical	c. thermal	d. light
2. Which of the following ene	rgy forms is	n't produced from th	ne Sun?
a. Thermal energy.	0,	b. Light energ	
c. Kinetic energy.		d. Radiation e	nergy.
3. Rusting of iron forming roo	ks is an exa	mple of	
a mechanical weathering.		b weathering	by wind.
c deposition in rivers.		d chemical w	eathering.
4. The output energy in the N	/lars explora	tion vehicle is	energy
	light	c. kinetic	d. solar
(B) Complete the following f	igure :		
			2
1 Used in	 Electric 	lamp Produces -	
1. Used in	Liectric	tatrip	4 3,
			W4 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
(A) Write the scientific term	of each of t	he following:	
1. Any substance that produc			rned. (
2. The process by which sed			
		OWN BILLOT ILG GT GO IG.	(
3. They are used in crushing		fine hite of sand ar	nd ("
 A triangular landform form clay that formed due to flo 	w of river int	o the sea	(
(B) What are the factors that			? (2 points on
	2.	iamear weathering	(2 (55))
1.			
(A) Choose from column (B)	what suits i	t in column (A):	
(A)		(B)	
1 Water	a ge	nerate electricity by	using solar energy.
2. Law of conservation of er	nergy b end	ergy doesn't destroy	, nor create from
3 Canyon	no	thing.	
4 Solar panels			formed due to powe
4 Solai paliolo		lowing water erosio	
	u. IS I	enewable resource	
1	alad	3.	4.
(B) Give a reason for the fol	lowing:		
(B) Give a reason for the fol	lowing :		

We must conserve the fossil fuels.

ETTA SALE	EXAMIN.	47710041
ETM AL	IN I D BUILD	Charles Man

10	Daylor Same	Scien	nce Inspectorate
(A) Co	omplete the following :		
1. Ligi	ht energy is converted into par inside the trees.	energy wh	ich is stored in the form o
2.	is the main sour	ce of energy on the Earth	n's surface
3.	are deep valleys	carved by flowing water	
4.	is the process of	lying down of sediments	after its erosion.
	nat happens when?		
(A) Pu	ıt (✓) or (X) :		
1. Usi	ng solar energy is a way to	conserve fossil fuels.	(
2. Wa	ter is a nonrenewable resor	urce that is used to gener	ate hydroelectricity. (
3. Wir	nd turbines convert the kind	etic energy into electrical	energy. (
4. Car	nyons are formed in a shor	t period of time.	(
(B) Wh	nat is the role of wind in m	nechanical weathering?	
(A) 1.	Write the scientific term o	of each of the following	
1. Ene	ergy is neither created nor inother.	-	
2. A g	as in air combines with iror	n of some rocks and caus	ses their weakness.
2.	Complete the following to	able:	
	Device	Input energy	Output energy
	1. Electric heater:		
	2 Hand bell:		

(B) Give a reason for the following:

Hydroelectric dams are built on rivers.

11	(Science Ins	spectorate	
(A) Complete the	following statements using	words between	brackets:	
1. Coal and oil are		resources of en	ergy.	
	ulls down broken rocks at m		alled	
	re used to generateblow in desert, la		are formed	
4. When strong		ige saile dulles	are formed.	
(B) Give a reason f	~			
(A) Choose the co	rrect answer :			
1. The dropping of	sediments in a new place is	known as		
a erosion.	b freezing.		d deposition	
2 Extreme heat ar forming	nd pressure under the Earth'	s surface has ar		
a. wood.	b. wind.	c. fossil fuel.	d. biofuel.	
From factors of	mechanical weathering			
a. oxygen.	b. acid rains.			
c. temperature.	d. acids of lichens.			
4. The output ener	gy that is not from the job of	hair dryer is		
a. chemical.	b. sound.	c. kinetic.	d light.	
(B) Correct the uni				
Dunes are lowla	and areas which have gentle	e sloped sides.	()
(A) Choose from c	olumn (B) what suits it in co	olumn (A) .		
	(A)		(B)	
A robotic vehicle surface of Marketine	cle designed to explore the	a erosion. b. fuel.		
*	re used to generate		er Curiosity.	
when it is burn		e electrica		
4 The process o	of movement of sediments from			
1	2 3	3	4.	
(B) What happen i	f?			

River erodes the rock of mountain over a long period of time

12	1=10-		South Educati	ional Zone		
(A) Ch	oose the correct	answer:				
1. Lich	nens produce se rocks.		cks that dissolve minerals	found in		
a. o	xygen	b. acids	c. water	d. rain		
2 All c	of the following ar	e forms of fuel,	except			
a. n	atural gas.	b. gasoline,	c. coal.	d. glass.		
3. The	formation of can	yons takes				
a fe	ew minutes.	b few hours.	c few days.	d many y	ears.	
4. The	energy source in	a toy car is				
a. e	ngine.	b. wires.	c. battery,	d. wheels.		
(B) Giv	e a reason for th	e following:				
Iro	n in rocks may ru	st.				
(A) Pu	t (🗸) or (x) :					
1. Whe	en iron in rock rus	sts, the rock bed	comes more stronger.		(1
2. We	have to conserve	all forms of fue	ol.		(1
3. Botl	n coal and wood	produce therma	l energy when they are b	urned	(,
	d is a nonrenewa				(1
(B) The	ere are many typo	es of sediments	. Mention 2 types of ther	m	,	1
	* * * * * * * * * * * * * * * * * * * *		The state of the s			
63						
(A) Co	mplete the follow	wing sentences	by using these words:			
			cks – thermal – kinetic)			
			wn of some types of			
			ergy converted into	, ene	ergy.	
	en the force of wir	nd	, the sand can't travel for	a long dista	ance.	
4. We	need	energy for cod	oking food and warming h	ouses		
(8) Wh	at happens if?	?				
The	wind that is carr	ying sand partic	cles hits a big rock.			

13	-	Kafi	r El-Dawar E	ducational Zone	2
(A) Choose the co	rrect answer :				
1. Fossil fuel is ex					
a the Earth's se	urface b the under	ground.c the	e food.	d the water	
2 The Sun and wi	ind are considered as	S	resource	s of energy.	
a renewable	b nonrenew	able c de	estroyed	d harmful	
3 Breaking down	of rocks due to acids	is known as	S		
a. erosion.		b. sedi	iments.		
c. mechanical v	veathering.	d. cher	mical weath	ering.	
Energy produce	ed from the electric b		ener		
a. chemical	b. sound	c. lig	ht	d. kınetic	
	for the following:	Pa *4 *	-1		
Fossil fuel can	't be replaced soon a	itter it is use	d.		
2 (A) Put (V) or (X)	a •				
	bines advantages is		enerate elec	tricity	, ,
•	n though the wind do				()
	d from the sea anima			al	()
Erosion is the p to other places.	rocess in which the s	small particle	es are move	u	()
*	milar in their colors, t	exture and s	hapes.		()
(B) What happen i					
· ·	reacts with iron of so	me rocks.			
(A) Complete the	following sentences	•			
	a deep valley carved		water.		
	es Earth with light an				
	ed from the radio whi energy.		device do i	s main	
	the breaking down o	f rocks into s	smaller piec	es.	
	gy changing in the fo				
Device	Consumed (input			d (output) ene	rgy
1. Hair dryer :					

Fan:

	LONE
FINAL EXAMINAT	IL 2PM

Ц	7		bani Mazar Eqi	rcational Zone
	(A) Choose the cor	rect answer :		
	1. The output energ	y when playing drums	is the e	energy.
	a. chemical	b. light	c. sound	d. potentia
	2. Sand is formed of	lue to breaking down o	of	
	a, glass.	b. wood.	c. rocks.	d. plastic.
	3. The input energy	when using the lamp	is the e	nergy.
	a. electrical	b. potential	c. kinetic	d. thermal
	4. All the following a	are forms of fossil fuel,	except	
	a. water.	b. coal.	c. natural gas.	d. oil.
	(B) What happens i	f?		
		ds near a lighted lamp		

(A) Put (✓) or (x):			
 Energy may be destroyed inside different devices. 		()
Sand dunes are formed by erosion only.		()
3. Most of energy chains start with the Sun.		()
(B) Correct the underlined words:			
1. Deltas are formed by weathering process.	()
Dams are built on rivers to generate solar energy.	(
(A) Write the scientific term of each of the following:			
1. The energy used to play a drum.	()
2. Process in which rocks are broken down into smaller particles.	(
3. A mill that is turned by wind flow.	(
4 It is any substance which produces thermal energy on burning.	()
(B) Mention the input and output energies of the opposite device. 1. Input energy is	6	5	
2. Output energy is			

1 2			2Cience i	inspectorate	
	(A) Choose the co	rrect answer :			
	1 The output energy when playing drums is the			energy.	
	a. chemical	b. light	c. sound	d. electrical	
	2. Water flows thro	ough turbines in dams	to generate	energy.	
	a. electrical	b. potential	c. light	d. solar	
,	3. Sand is formed	due to breaking down	of		
	a. glass,	b. wood.	c. rocks.	d. plastic.	
4	4 is a steep valley that is formed due to flowing of water steams				5
	a. Canyon	b. Mountain	c. Hill	d. Sand dune	
((B) Give a reason	for the following :			
	Iron inside rock	ks may rust.			
	(A) Put (V) or (X)	in front of the follows	ng statements:		
	1. You need gasoli	ine to move a bicycle.			()
	_	rned, it produces therr			()
		nsidered as one of the		eathering.	()
	4. When water free	ezes, its volume decre	ases.		()
	(B) What happen v				
	You turn on an		(according to t	he change of er	nergy)
	(A) Correct the un	darlinad wards			
		stored inside the batte	ry of mobile phone.	()
		des oil, coal and wood		()
		and found in a desert a		š. ()
		s is usually followed by)
		ice that converts elec			ound
	(b) Mention a dev	ite mar converts elec	tirear energy mice wo		

energy.



- Unit Three Project.
- Interdisciplinary Project.
- Unit Four Project.





UNIT THREE Projects

Dam Impacts

- In modern times, scientists and engineers use the kinetic energy found in rivers water to generate electrical energy by building dams on rivers to control the flow of rivers water and use it to rotate water turbines that generate electricity.
- Building dams on rivers to generate
 electricity depends on the idea of making
 artificial waterfalls to simulate natural
 waterfalls, in order to increase the kinetic
 energy of river water, which is used to rotate
 water turbines to generate a type of electrical
 energy known as "hydroelectric energy".



Water dam

- Building dams has many advantages and benefits for humans and the environment, such as:
 - Providing people with the electrical energy needed for lighting and operating different devices in homes, factories... etc.
 - Helping people control the level of the river water to protect the agricultural lands on both sides of the river from the danger of flooding.
- However, building dams also has many disadvantages and negative effects on humans and the environment, such as:
 - Changing the path of rivers, which affects the migration of fish through these
 rivers, which causes the death of fish or their migration to other water areas,
 so people are affected as they depend on fish as a source of food.
 - Lakes that are formed behind dams cover large areas of land with a very big amount of water and these lands are considered as a habitat to many animals and plants, so this leads to the death of these animals and plants or the migration of these animals to other areas.



Flood

Use the previous text or online sources to make a research project about dams.

Your research must include the following main points:

- An energy chain shows the energy changes of the kinetic energy of moving water to get electrical energy in a dam.
- Advantages of building dams for humans and environment.
- Disadvantages of building dams for humans and environment.
- Finding a solution to one of the problems of building dams.
- Energy chain of a dam:

Advantages of building dams:

Disadvantages of building dams:

A solution to one of the problems of building dams:

INTERDISCIPLINARY Project

Sunny Side Up

- In many villages around the world, people depend on wood of trees as fuel to cook food, and for this reason people in these areas cut down a lot of trees that leads to the removal of a lot of forests worldwide causing deforestation which has negative effects on the whole world, such as:
 - The disappearance or death of some animals that lived in these forests before they were removed.
 - The disappearance of many types of plants that are used in the manufacture of medicines.
 - Deforestation can be stopped by using solar
 energy instead of wood of trees as a source of energy for cooking food because solar energy is free, clean and renewable energy.

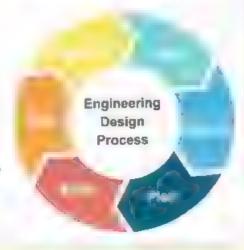
 But, there are some difficulties that humans face when using solar energy as a source of energy, including:
 - The materials used to collect solar energy are very expensive
 - The amount of sunlight that reaches the Earth is not the same from one place to another on Earth's surface.
- solar energy into thermal energy used in cooking food. It contains metal plates placed in a certain way to collect the largest amount of solar energy and focus it in one area, and it also contains materials that keep the generated thermal energy inside the solar cooker for a period of time enough to cook food inside.

· A solar cooker is a device that converts

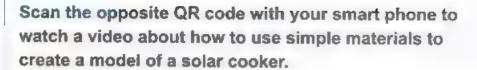
▶ In this project, use the steps of the "Engineering Design Process" that you have learned in the previous educational grades to create a model of a "Solar Cooker" that can be used in sunny regions to cook food.



Solar cooker



Note





ldea

Create a model of a solar cooker that can be used to cook food using some simple materials.

Materials

You may use the following materials to create your solar cooker:



Carton box



Glue



Black paper sheet



Aluminum foil

White cork sheets

Transparent plastic sheet

Wooden stick

Plan

Build

Draw the design of your solar cooker model.

Test

Test your solar cooker and write your observations and problems you may find in your model.

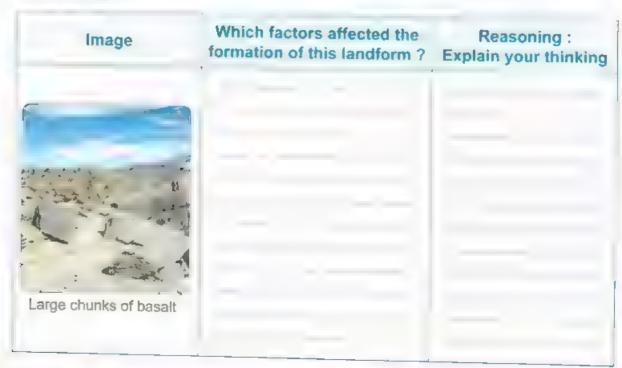
Improve

Write down your ideas to improve your solar cooker model.

UNIT FOUR Project

Forces That Shape the Earth

- Wadi Nakhr's landscape has been shaped by the weathering forces of wind, water, ice and erosion. You can also find evidence of volcanic activity that occurred millions of years ago, where:
 - Wind, water and ice are factors of mechanical weathering that break rocks into smaller pieces, then wind and water carry these pieces away through the erosion process. When these sediments deposite and exposed to pressure they form different layers of rocks.
 - Some volcanoes form sharp peaks of mountains, and also when the molten lava that comes out of these volcanoes cools, they form igneous rocks like basalt.
- Look at the following images of landforms in Wadi Nakhr and predict what factors (like erosion, weathering, volcanoes, ... etc.) played an important role in shaping landscape over time and explain your reasoning:



Reasoning : Explain your thinking Which factors affected the Image formation of this landform? Smooth, steep sides Decpi, iyot ayers in ch Rippling mountainside



SERIES

SCIENCE

By A Group of Supervisors







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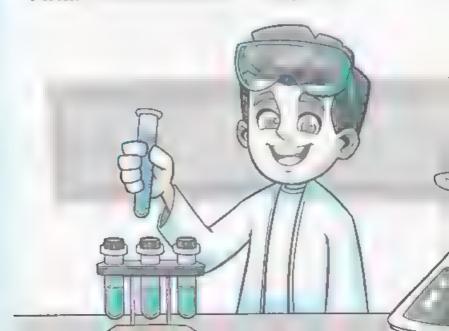
Guide Answers of

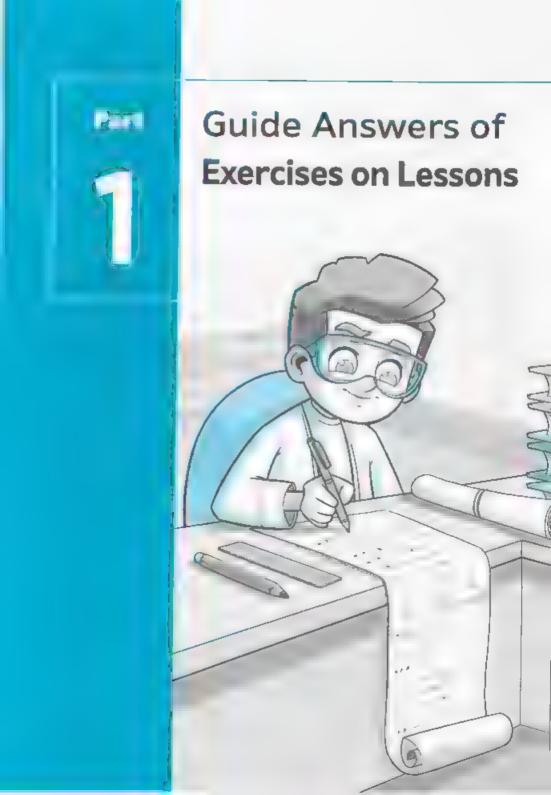
Self-Assessments

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Part

Guide Answers of Final Examinations (Page 27)





UNIT THREE: Energy and Fuels

Europe Learner (

3 c

6 b

Exercises on Lesson (1

- 1 a 2 a
 - 4 c 5 d
- 1 (x) 2 (\sqrt) 3 (x) 4, (\sqrt) 5, (x) 6. (\sqrt)
- 1. Sun 2. batteries
 3 Mars
- 1 Battery.
 - 2 Electrical energy
 - 3. Mars rover Cunosity
- 5 1 converted
 - 2 chemical electrical kinetic
 - 3. electrical 4. battery
 - 5. electrical
 - 6 solar electrical
- 1. Because the chemical energy stored in the battery is converted into electrical energy that changes into kinetic energy that makes the car move
 - Because the energy of sunlight (solar energy) is converted into electrical energy which calculators use to be operated.
 - 3 Due to the presence of solar panels that use sunlight to recharge its batteries.

- 1 The car will not move, so we can recharge its batteries by connecting toy car to a nearby charger or replacing old batteries with new ones.
 - Solar energy is converted into electrical energy that operate them
 - It cannot be operated, because it depends on sunlight (solar energy) to recharge its battery.

Exercises on Lesson 2

- 1 1 a 2 b 3 a 4 c 5 d 6 a
- 2. 1. (\$\sqrt{}\$) 2. (\$\mathbf{x}\$) 3. (\$\mathbf{x}\$) 4. (\$\sqrt{}\$) 5. (\$\sqrt{}\$) 6. (\$\mathbf{x}\$)
 - 4. (√) 5. (√) 7. (√) 8. (×)
- 1. Electrical energy.
 - 2. Electrical energy.
 - 3. The Sun.
 - 4. Thermal energy.
 - 5. Coal
 - 6 Chemical energy
- 1. electrical
 - 2. potential kinetic
 - 3. kmetic sound
 - 4. kinetic thermal
 - 5. heat

- Because the potential energy stored in its spring is converted into kinetic energy that moves the soap poward.
 - 2 Because the kinetic energy is converted into thermal energy
 - Because some of the energy
 wasted in the form of heat.
- 1. The electrical energy is converted into sound energy and light energy
 - The chemical energy is converted into thermal energy and light energy
- 7 1 Chemical Thermal Light,
 - Chemical Thermal Kinetic
 Electrical Kinetic Sound

Exercises on Lesson (3

- 1 1.b 2 a 3.d 4.a 5.b
- 2 1. (\(\psi\) 2. (\(\pi\) 3. (\(\psi\) 4. (\(\psi\) 5 (\(\psi\)) 6 (\(\psi\))
- 1. Light energy.
 - The law of conservation of energy
 - 3. Sound energy
 - Kinetic energy,
 - Electrical energy.
- 4 1 chemical kinetic
 - 2 thermal
 - 3 electrical thermal

- 4. conservation of energy.
- created destroyed converted
- 6. light thermal
- 1. Because some of the electrical energy is converted into thermal energy
 - Because battery is the source of energy where the chemical energy is converted into electrical energy to operate the toy car.
- 1 You feel warm, because some electrical energy is converted into thermal energy.
 - The kinetic energy is converted into sound energy
- 1. chemical
 - 2 electrical
 - 3. chemical electrical light thermal

Exercises on Lesson 4

- 1.a 2.b 3.a 4.d 5.c 6.b 7.a 8.c
- 2. (x) 2. (√) 3. (x) 4. (x) 5. (√) 6. (√)
- 3 1. Chemical energy.
 - 2. Electrical energy.
 - 3. Thermal energy.
 - 4. Kinetic energy
 - 5. Thermal energy,

- 4 1. light sound
 - 2 thermal
 - 3. electrical thermal kinetic sound
 - 4 sound thermal
 - 5 kinetic
 - 6 electrical light thermal
 - 7 electrical chemical
 - 8 electrical output
 - 9 input output
- 5 1 Because it doesn't help the mobile phone to do its main function.
 - Because it is converted into kinetic, thermal and sound energies.
 - Because they don't help the blender to do its main function.
- 1 Some energy is wasted as thermal energy.
 - The electrical energy is converted into kinetic energy which do the main function of fan and sound energy as wasted energy
- 7 2 --- 4 --- 1 --- 5

Model Exam (1) orr@emcopt (0:1)

- (A) 1 c 2.c 3.a 4.d
 - (B) Solar energy is converted into electrical energy that operates them.

- (A) 1 (x) 2 (x) 3 (√) 4 (√)
 - (B) 1, chemical electrical
 - 2. electrical light thermal
 - 3. chemical electrical light thermal
- 3 (A) 1. Electrical energy
 - 2 Kinetic energy
 - 3. Electrical energy
 - 4 Thermal energy
 - (B) 1. (√) 2. (*) 3. (√) 4. (×)

Model Exam (2) un Geneept (3.4)

- 1 (A) 1. b 2. s 3. d 4. a
 - (B) You feel warm, because some electrical energy is converted into thermal energy
- 2 (A) 1. Mars 2. Sun 3. chemical 4. electrical
 - (B) Because it doesn't help mobile phone to do its main function.
- (A) 1. Electrical energy
 - 2. The law of conservation of energy
 - 3. Thermal energy
 - 4. Sound energy
 - (B) 1. b → C
 - 2. c → A
 - 3. a ------ B

Concept (12)

Exercises on Lesson 1

- 11.d 2d 3c 4.b
- 2 1, b 2 d 3. c
- 1 (x) 2. (\(\sigma\) 3 (\(\sigma\)
 4. (\(\sigma\) 5. (\(\sigma\)
- 1. thermal
 - 2 The Sun
 - 3. thermal energy
- 1. The Sun.
 - 2. Thermal energy
 - 3 Fuel.
- 6 1. thermal kinetic
 - 2 coal natural oas wood.
 - 3. coal wood
- 7 1. Because fuel is burned inside the engines to produce thermal energy that is changed into kinetic energy which causes the different means of transportation to move.
 - 2 Because the fuel in the car tank runs out.
 - 3 To produce thermal energy which changes into kinetic energy that causes the car to move
- 1 The car fuel indicator will go down

- The car movement decreases gradually until it stops.
-] 1 b 2 a 3. d

Exercises on Lesson (2)

- 11.d 2.b 3.a 4.b
 - 5.d 6.a 7.b 8.c
- 2 1. d 2. c 3. a
- 3 1 (x) 2 (x) 3 (x) 4 (x)
 - 5. (x) 6, (√) 7. (√)
- 1, a small
 - mall 2, wood
 - 3. a long
- 4. The Sun
- 5. plants
- 6. decreased.
- 7. biofuels
- 8. Natural gas
- 9. reducina
- 5 1. Renewable resources of energy
 - Nonrenewable resources of energy
 - 3. Liquid fuel,
 - 4. Fossil fuels
 - 5. Coat
 - 6. Oil
- 5 1 renewable natural gas
 - 2. renewable
 - 3. nonrenewabie
 - 4. biofuels fossil fuels
 - 5. biofuel charcoal
 - 6. charcoal oil coal
 - 7. liquid
 - sea creatures pressure,

- 1 Because they can be replaced shortly after being used
 - Because they are used at a rate faster than they can be renewed
 - Because continuity of cutting down trees leads to deforestation.
- It leads to deforestation, which causes negative effects on the environment.
 - They are converted into fossil fuel
 - They will form oil and natural gas

Exercises on Lesson 📳

- 11 d 2 c 3 b 4 a 5 b 6 c 7 a 8 d
- 21d 2.c 3a
- 1. (\(\sigma\) 2. (\(\sigma\) 3. (\(\sigma\) 4. (\(\kappa\) 5. (\(\kappa\) 6. (\(\sigma\)
- 1. natural gas. 2. heat
 - 3. renewable 4. kinetic energy
 - 5. electrical
- 5 1 Fossil fuel 2 Turbine 3 Water 4. Generator
- 6 1 nonrenewable
 - 2. renewable electricity.
 - 3. thermal

- 4 kinetic electrical
- 5. steam
- kinetic generators
- 7. thermal kinetic
- 1. Because generators convert kinetic energy into electrical energy
 - 2. To conserve the electricity.
- Turbine cannot produce kinetic energy, so the generator will not turn and don't generate electricity
 - 2 Water will not produce steam, so the turbine will not move and will not produce kinetic energy
- 1 c 2 a 3 b
- 11. (√) 2. (×) 3. (√) 4. (×)
- (3) Steam turns the turbine .
 - (1) Fuel is burned
 - (5) Electrical energy is sent
 - (2) Water becomes hot
 - (4) Turbine turns the generator

Exercises on Lesson 4

- 1 1.d 2.c 3.b 4.a 5.b 6.a 7.c 8.d 9.d 10.a 11.c 12.a
 - 13. c
- 2 1.d 2.c 3.a

- 3 1 (34) 2 (V) 3 (X) 4 (V)
 - 5. (*) 6. (V) 7. (X) 8. (V)
 - 9. (1) 10. (1)
- 1 nonrenewable resources
 - 2. fossil fuels 3. pollute
 - 4 renewable Renewable
 - 6. biofuel 7 increase
 - 8 Nonrenewable
- 1. Global warming.
 - 2. Respiratory system.
 - Acid rain.
 - 4. Enseil friels
 - Global warming.
- f. soll water.
 - 2. air soil water
 - 3. air eyes lungs
 - 4. smog respiratory
 - 5. carbon dioxide water rain
 - carbon dioxide air.
 - 7. fish.
 - 8, carbon dioxide global warming
 - 9 soil acid
 - 10. solar energy wind energy.
 - 11 temperature climate
 - 12. gases heat.
 - fossit
 - 14. renewable
 - 15 renewable water wind.
- 1 Because the smog of cars causes imitation of human's eyes and lungs.
 - 2 Because pesticides cause the collution of soil and water.

- 3. Because burning fossil fuel produces carbon dinxide das which combines with water in air forming acid rain.
- 4. Because burning coal and oil produces carbon dioxide gas which forms a layer in atmosphere that traps heat on Earth causing rise in Earth's temperature that causes global warming.
- 5 Because acid rain causes dissolving of some rocks including the rocks used for building
- Because fossil fuels are formed over millions of years.
- Because when fossil fuels are burned, they release gases that cause air pollution.
- It causes the pollution of water and soil.
 - 2. The pollution of air, water and soil will decrease
 - 3 It causes dissolving of the rocks used for building.
 - 4. The amount of carbon dioxide gas in air will decrease.
 - 5 Fossil fuel will run out on the Earth.
 - 6. The Earth's temperature will not increase.
- 9 1. c 2. b 3. c
- 10 1. d 2. b 3. c

Exercises on Lesson 5

- 🚺 1 d 2 c 3 d
- 2 1 b 2 d 3 a
- 1 (V) 2 (X) 3 (X) 4 (X)
- 4 1. Solar energy.
 - 2 Coal
 - Walking or using bicycles instead of driving a car.
 - 4. Air pollution.
 - Not increasing the Earth's temperature.

Model Exam (1) on Concept (3.2)

- (A) 1, thermal
 - brofuels 3 fossil fuels
 pollute
 - (B) The Earth's temperature will not increase.
- 2 (A) 1. 5 2. d 3. c 4. d
 - (B) Because the continuity of cutting trees leads to deforestation.
- (A) 1 coal natural gas
 - 2. kinetic electrical
 - 3. renewable
 - 4 biofuels fossil fuels
 - (B) 1. d 2. c 3. a

Model Exam (2) on Concept (3.2)

- 11 (A) 1. d 2. a 3. b 4. d
 - (B) Because generators convert kinetic energy into electrical energy
- (A) 1. The Sun.
 - 2. Oil.
 - 3 Renewable energy resources.
 - 4. Generator
 - (B) Fossil fuels will run out on the
- 3 (A) 1. (K) 2. (√) 3. (√) 4. (K)
 - (B) Charcoal (All items are fossil fuels except charcoal is a biofuel)

Concept (3.3)

Exercises on Lesson 🚹

- 1 1.a 2.b 3.a 4.b 5 c 6.d 7.d 8.a
 - 5. c 6. d 7. d
- 9.c 10 b 11.c
- 2 1.b 2.c 3.a
- 3 1, (x) 2, (\sqrt{)} 3, (x) 4, (x)
 - 5. (*) 6 (*) 7. (*) 8. (*)
 - 9 (v) 10.(x) 11.(v)
 - 12. () 13. ()
- 1 solar
- 2, water flow
- 3. Electric 4. low
- 5. the Sun 6. light

- 5 1 Watermill 2 Windmill
 - 3. Electrical energy
 - 4. Wind turbine
 - 5. Convergent (concave) mirrors.
 - Greenhouses.
 - 7 Solar water heater
- 1 thermal kinetic
 - 2 blades electrical
 - 3. windmills watermills
 - 4. kinetic
 - 5. kinetic electrical
 - 6 Sun radiant
 - 7 warm
 - 8. concave mirrors sunlight
 - 9 thermal warm
- Because they helped them to crush grain to make flour.
 - 2 Because the atomsphere, land and water of Earth absorb the thermal energy of the Sun which causes increasing in the Earth's temperature
- 1. The blades of wind turbines don't move and also don't generate electricity.
 - 2 The solar energy of the Sun is converted into electrical energy
 - 3 The greenhouse absorbs the radiant energy from the Sun and convert it into thermal energy

- 10 1. (-) 2. (-) 3. (\sqrt{)} 4. (\sqrt{)}

Exercises on Lesson 2

- 1 1.a 2.b 3.d 4.a 5.d 6.b 7.d 8.a
- 2 1. (x) 2. (√) 3. (x) 4. (x) 5. (x) 6. (√)
- 3 1. electrical 2. kinetic 3 move 4. Wind
 - 5. faster
- 1. Solar panel.
 - 2 Wind
 - 3. Wind turbine
 - 4. Electrical energy
- 5 1 electrical
 - 2. electrical batteries
 - 3. electrical irrigation
 - 4. radiant Sun
 - 5 temperatures
 - 6. kinetic
 - 7. kinetic electrical
 - 8 faster 9 electrical
 - 10 kinetic increase
- To absorb the solar energy coming from the Sun and convert it into electrical energy

- 2 Because by increasing kinetic energy of the wind, the blades rotate faster and wind turbine generates more electricity
- 3 Because sometimes the wind doesn't blow, so their blades don't move, so wind turbines don't generate electricity
- 7 1. The solar cells absorb solar energy and convert it into electrical energy that is used to charge the battery of calculator
 - Its blades rotate faster and generates more electricity.
 - 3 It causes the movement of air and wind blowing

	Used energy	Produced energy
1.	Solar	Electrical
2.		Electrical

- 9 1. Radiant
- 2 Thermai
- 3 Kinetic
- 4 Electrical
- 5. Kinetic
- 6 Sound thermal

Exercises on Lesson (3

- 1 1.a 2.b 3.c 4.b 5.a
 - 6.c 7 a 8.d 9.c 10 b
 - 11. b 12. a 13. d

- 1. (x) 2. (√) 3. (x) 4. (√)
 - 5. (x) 6 (\sqrt{)} 7. (x) 8. (\sqrt{)}
 - 9.(x)
- 3 1. electrical 2. gravitational
 - 3. electrical 4 water
- 1. Water turbine.
 - 2. Hydroelectric energy
 - 3. Hydroelectric dam.
 - 4. Water turbine.
 - Evaporation process
 - 6. Water cycle
 - 7. Condensation process
- 5 1. gravitational potential kinetic
 - 2 dams potential electrica
 - 3 water potential
 - 4 hydroelectric energy.
 - 5. wind kinetic electricity.
 - 6 furbine
 - 7. dams wind
 - 8. turbines
 - 9 the Sun wind water
 - 10, turbines
 - 11 kinetic electrical
 - 12 evaporation condensation
 - 13. kinetic hydroelectric
- To control the water flow and increase the potential energy of water to generate electricity
 - Because water turbines convert kinetic energy of flowing water into electrical energy
 - 3 Because kinetic energy of moving water in dams is used to rotate water turbines to generate hydroelectric energy

- Potential energy of water behind dams is converted into kinetic energy which causes water turbines rotate and generate electricity.
 - 2 It converts into more kinetic energy which causes water furbines rotate faster and generate more electricity
 - Clouds are formed and rain. may fall
- 1. Potential
- 2 Kinetic
- 3 Ejectrical
- 4. Light sound
- 5. Thermail

Points of comparison	Wind turbines	Water turbines
Energy used :	Kinetic energy of wind	Kinetic energy of water
Type of used energy .	Renewable energy	Renewable energy
Produced energy:	Electrical energy	Electrical energy

10 1. (3) 2. (1)

3. (4) 4. (2)

Model Exam (1) on Goncept (3.3)

- (A) 1 Electrical energy
 - 2. The Sun.
 - Wind turbine.
 - 4. So ar water heater.

- (B) To control the water flow. and increase the potential energy of water to generate electricity
- (A) 1. light
- 2 faster
- 3. solar
- 4. gravitational
- (B) The solar panels will absorb the solar energy coming from the Sun and convert it into electrical energy
- (A) 1. (V)
- 2.(x)
- 3. (1)
- 4. (x)

2 Kinetic

- (B) 1. Potential
 - 3 Electrical
 - 4. Light sound
 - 5. Thermal.

Model Exam (2) on Concept (3.3)

- 1 (A) 1, b 2, c
- 3. c
- (B) 1. Solar
- 2. Electrical
- (A) 1. Water turbines.
 - 2. Evaporation process.
 - 3 Wind.
 - 4 Greenhouse.
 - (B) They are used in crushing grain to make flour.
- 3 (A) 1. (√) 3. (×)
- 2. (1)
- 4. (30) (B) Because the atmosphere, land and water of Farth absorb the thermal energy of the Sun which causes increasing in the Earth's temperature.

UNIT FOUR: Shifting Surfaces

Consumed the fi

Exercises on Lesson

- 1.0 3 d 40 2 8 5. d 6 c 7. b
- 2 1. d 3. b 2.0
- 1.(1) 2.(1) 3. (4) 4. (x) 5. (V) 6. (x) 7.(x)
- 1 Erosion of the sandcastle 2 Canvons. 3. Costal rocks.
- 5 1, water 2. rocks 3 wind 4 erosion, 5 fast - slow
- 6 Because they are formed due to the slow changes that happened to their rocks over many years.
- The shape of costal rocks will change due to breaking down of some parts of rocks.
- 8 1. b 2. c

Exercises on Lesson 2

- 11.a 2.b 3.a 4.b 6 b 7 a 8.c 9, d 10, c
- 2. (x) 3. (x) $4.(\checkmark)$ 2 1. (</ (x)
 (√)
 (x) 8. (x) 10. (ac) 9. (🗸)
- 2. b

1 1. a

- 3. b
- 4. a

- 1 Weathering Deposition.
- 2 Erosion 4 Plant roots
- 5 Weather.
- 6 Chemical weathering
- 7 Limestone caves.
- 8 Freezing process
- 9. Oxygen gas.
- 1. weathering
 - 2 mechanical chemical
 - 4 chemical 3 mechanical
 - 5 acids
- 6 erosion 8. minerals
- 7 chemical
- 9 friction 10 rocks - mechanical
- 1 Due to the reaction between iron and oxygen of air.
 - Because water dissolves minerals in rocks, then this dissolved minerals combine again forming new shapes
- 1 The minerals of these rocks dissolve causing their breaking down.
 - 2. These rocks become weak and can break down easily
- 7 II. M 2.0 3 C 4. M 5 M 6 M
- 8 1. (x) 2. (√) 3. (x) 4. (sc)

Exercises on Lesson 3

- 2 1 (×) 2 (√) 3 (√) 4 (√)
- 1. Weathering.
 - 2 Mechanical weathering
 - 3 Chemical weathering
- 1. mechanical 2. mechanical
 - 3 chemical 4
 - 4 chemical

Exercises on Lesson (4

- 11 c 2 d 3 a 4 d
 - 5 c 6 b 7 c 8 c
 - 9. b
- 2 1 (\(\sigma\) 2 (\(\sigma\) 3 (\(\sigma\) 4 (\(\max\))
 - 5. (x) 6. (x) 7. (\sqrt{)} 8. (\sqrt{)}
 - 9 (x)
- 3 1 Erosion.
- 2 Deposition
- 3 A delta
- 4 A sand dune
- 5 Sediments
- 6 Gravity
- 4 1. water
- 2. wind
- 3 wind water
- 4. wind
- 5. sand grains
- 6 sand dunes
- 1. Because the sediments are deposited at the end of the river.
 - Because they are formed by the effect of weak winds.
 - 3 Because they are formed by the effect of strong winds.

- 6 A delta may be formed
- 7 1. (2) 2. (1)

Exercises on Lesson 5

- 11 1.c 2 a 3.b 4.d
- 2 1 (x) 2 (√) 3 (x)
- 3 1 Canyons. 2 Erosion 3 Deposition
- 1 rocks 2. mechanical 3. mechanical 4. winds
- 5 1 2 2 1 3 deposition

Model Exam (1) on Concept (4.1)

- 1 (A) 1.d 2 b 3 c 4 d
 - (B) Due to the reaction of oxygen gas that is present in air with iron
- 2 (A) 1 (\checkmark) 2 (\checkmark) 3. (\checkmark) 4. (x)
 - (B) The acids dissolve minerals that are present in these rocks.
- (A) 1. Erosion process
 - 2. Chemical weathering.
 - Delta.
- 4. Canyons.
- (B) 1. b
- 2. c

Model Chain (2) on Consupt (4.4)

- 1 (A) 1.c 2.b 3.a 4.c
 - (B) Because they are formed due to the slow change that happened to their rocks over many years
- (A) 1. (√) 2. (√) 3. (x) 4. (√)
 - (B) A delta may be formed.
- (A) 1. chemical 2. wind 3. dunes 4. mechanical (B) 1. (2) 2. (1)

Concept (4.2)

Exercises on Lesson

- 1.b 2.c 3.c 4.a 5 c 6 b
- 2 1. (√) 2. (x) 3. (√) 4. (√) 5. (x) 6. (x) 7. (√) 8. (√) 9 (x)
- 3 1. Canyon.
 2. Weathering and erosion processes
- 1 impression 2. canyon 3. water. 4. gently

- Due to flow of water stream which is needed by plants to grow
- 1 A smail canyon may be formed
 2. The small canyon could get

The small canyon could get deeper

Exercises on Lesson (2

- 11.b 2.a 3.d 4.b 5.a 6 c 7.d 8.b
- 2. (x) 2. (√) 3. (√) 4 (√) 5. (x) 6. (√) 7. (x)
- 3. speed 4. sediments
 5. gravity
- 1 Because it may help in building houses in safe places.
 - Because the shape of a valley depends on several factors including:
 - The type of rocks exist in the landscape.
 - The speed, age and size of river that form the valley
- 5 1 It causes weathering and erosion of the house.
 - 2. A canyon may be formed.
- 6 1. Wealhering 2 Deposition 3. Erosion

Exercises on Lesson (3

- 11.c 2.b 3.a 4 b 5 c 6 d
- 2. (x) 3. (√) 4. (x) 5. (x) 6. (√) 7. (√)
- 1. Valleys. 2. Delta
- 1. rivers 2. speed
 3. deposition 4. canyon
 5. sut sand
- Because they help in increasing the rate of deposition process
- 6 A delta may be formed
- 11 A B 2 C 3 B

Exercises on Lesson (4

- 11.b 2 c 3 d 4.c 5 b 6 a 7 c
- 2 1. (\checkmark) 2. (\checkmark) 3. (x) 4. (x) 5. (x) 6. (x) 7. (x) 8. (\checkmark)
- 3 1. Erosion process. 2 Sand dunes

5 direction

1. rocks 2. wind.
3. decreases 4 hundreds

- 5 1 Because the large rock can block the path of sand which is carned by wind.
 - 2 Because the strong wind can move the sand for a longer distance than the weak wind.
- 6 Sand dunes may be formed
- (3) Flying sediment (1) Blowing of wind ...
 - (4) The sediment carves . . .
 - (2) Wind start to ...

Model Builta (1) IIII Consupt (6.0)

- (A) 1. a 2. b 3. b 4. c
 - (B) A canyon may be formed.
- (A) 1. (\checkmark) 2. (x) 3. (x) 4. (yc)
 - (B) Because the shape of a valley depends on several factors including:
 - The type of rocks exist in the landscape.
 - The speed, age and size of river that form the valley
- 3 (A) 1. rocks 2. wind. 3. decreases 4. hundreds
 - (B) 1. A B
- 2. C

Model Exam (2) on Concept (4.2)

- 1 (A) 1. Canyon.
 - 2 Erosion process.
 - Weathering and erosion processes
 - 4. Valleys.
 - (B) 1. deposition 2. canyons.
- (A) 1. increases.
 - 2. gravity
 - 3 direction
 - 4. deposition
 - (B) A delta may be formed
- [3] (A) 1. (x) 2. (√) 3. (x) 4. (x)
 - (8) (3) Flying sediments .
 - (1) Blowing of wind
 - (4) The sediments carve
 - (2) Wind starts to

Guide Answers of Self-Assessments



(h.fl)[

Self-Assessment

- (A) 1. (x) 2. (√) 3. (x)
 - (8) Because it contains solar panels that convert solar energy into electrical energy which is used to charge the robot's batteries.
- (A) 1. Sound energy
 - 2. Chemical energy
 - 3 Mars rover Curiosity
 - (B) 1. Remote controlled toy car. 2. Mars rover Curiosity
- 3 1. d 2. c 3. d

Self-Assessment

- 1 (A) 1. kmetic thermal 2 kinetic – thermal 3. thermal – kinetic
 - (8) Because it is converted into kinetic energy which is used to operate certain equipment in electric power stations.
- 2 (A) 1. (x) 2. (x) 3. (√)
 - (B) The potential energy is converted into kinetic energy that moves the soap upward.
- 3 1 light chemical
 - 2. thermal
- 3. chemical
- 4 electrical

Self-Austramont

- -3
- 1 (A) 1. a 2. c 3.
 - (B) The kinetic energy is converted into thermaenergy
- (A) 1. conservation
 - 2 chemical 3 thermal
 - (B) 1. Blender
 - Washing machine.
- 1 (2) (3) (4) 2. (3) - (4)

Self-Assessment 4

- (A) 1, thermal kinetic
 - 2 kinetic input
 - 3. chemical electrical
 - (B) Because they don't help the vacuum cleaner do its main function
- (A) 1. Electrical energy.
 - 2. Thermal energy
 - 3. Kinetic energy
 - (B) 1. Electrical energy.
 - 2. Thermal energy
- 3 1. (2) 2. (1) (3)
 - 3.(1)-(3)
 - 4. electrical electric power

Model Szant on Concept (8:4)

1 (A) 1, b 2, c 3, a 4, d

- (B) You feel warm because some electrical energy is converted into thermal energy
- 2 (A) 1. (\checkmark) 2. (*) 3. (*) 4. (\checkmark) (B) 2 \longrightarrow 4 \longrightarrow 1 \longrightarrow 3 \longrightarrow 5
- 3 (A) 1. Chemical 2. batteries 3. sound 4 Sun
 - (B) Because the potential energy stored in the spring of soap dispenser is converted into kinetic energy that moves the soap upward

Somout (MA)

Self-Assessment

- 1 (A) 1. c 2. c 3. d
 - (B) They are used as a source of thermal energy for cooking food and warming houses.
- 2 (A) 1. (×) 2. (√) 3. (√)
 - (B) Wood
 - Coal
 - Natural gas
- 1. Gasoline. 2. Wood
 - 3. Thermal energy.
 - 4. The Sun

Solf-Assessment

1 (A) 1. d 2. c 3. d

- (B) Because biofuel can be replaced shortly after being used
- (A) 1. (√) 2. (x) 3. (x)
 (B) Sea creatures will be decomposed and converted
- 3 1. b 2. c 3. d 4. a

into oil.

Self-Assessment 7

- (A) 1. c 2. b 3. d
 (B) The generator cannot convert
 - (B) The generator cannot convert the kinetic energy into electrical energy
- 2 (A) 1. (✓) 2. (K) 3. (✓)
 - (B) 1. nonrenewable
 - 2. steam
 - 3 wires
 - 3 1. Turbine. 2. Generator. 3. Coal. 4. Steam

Self-Assessment (8

- (A) 1. b 2. b 3. c
 - (B) Because burning coal and oil produces carbon dioxide gas which forms a layer in atmosphere that traps heat on Earth causing the increase of Earth's temperature
- 2 (A) 1. (X) 2. (X) 3. (√)
 - (B) The Earth's temperature will increase.

3 1 b 2.c 3.a

Sulf-Assessment

- 11 (A) 1 c 2 b 3 d
 - (B) Because when fossil fuels are burned, they release gases that trap heat in the atmosphere, so the temperature of the Earth increases and changes its climate.
- (A) 1. (√) 2. (x) 3. (√)
 - (B) People will suffer from irritation of their eyes and lungs and their respiratory system may be damaged.
- gases heat raises global warming .

Model Exam on Concepts (3.1) & (3.2)

- 11 (A) 1. a 2. s 3. c 4 b
 - (B) Because the chemical energy stored in the battery is converted into electrical energy that in turn changes into kinetic energy that makes the car move.
- 2 (A) 1. (\checkmark) 2. (\checkmark) 3. (κ) 4. (κ)
 - (B) It causes pollution of water and soil

- (A) 1. conservation of energy.
 - 2 kinetic 3, heat.
 - 4 Mare
 - (B) 1. The Sun.
 - Renewable resources of energy

Concept (3.3)

Self-Assessment (10

- 1 (A) 1. c 2. b 3. d (B) To generate electricity.
- 2 (A) 1 (X) 2 (X) 3 (V
 - (A) 1 (x) 2 (x) 3 (√)
 (B) It is converted into thermal energy that warms the inside of the greenhouses to allow farmers to plant crops that grow in warm climates
- 3. thermal 4. warm

W a smeat (

- (A) 1 solar panels wind 2 wind
 - 3. renewab e
 - (B) To absorb the solar energy coming from the Sun and convert it into electrical energy
- 2 (A) 1 (X) 2 (V) 3 (X)
 - (8) Wind turbines rotate slower and generate less electricity

- Wind turbine (B), because the wind applied to it is stronger than the wind applied to wind turbine (A).
 - 2. Wind turbine (A).

Self-Assessment 12

- (A) 1, water 2, kinetic
 - (B) Because strong wind helps the blades of wind turbines rotate faster so more electricity is generated.
- (A) 1. Coal. (All items are renewable energy resources, while coal is a nonrenewable energy resource).
 - 2 Hand mixer. (All items depend on solar energy, while hand mixer depends on kinetic energy)
 - 3 Wind (All items are nonrenewable energy resources, while wind is a renewable energy resource).

(B)

POC	Water turbines	Solar panels
1 Source of energy that is used to operate it	Water.	The Sun.
2. The produced energy	Electrical energy.	Electrical energy.

3 1. (✓) 2. (×) 3. (✓) 4. (×)

Model Exam on Theme (3)

- (A) 1 chemical electrical -
 - 2. kinetic thermal
 - 3. oil natural das
 - 4. wind
 - (B) They are used to generate electrical energy
- 2 (A) 1. (×) 2. (√) 3. (√) 4. (√)
 - (B) Because generators convert kinetic energy into electrical energy
- (A) 1. Solar panel
 - 2. Fuel
 - 3 Mars rover Curiosity.
 - 4. Kinetic energy
 - (B) The car movement decreases gradually until it stops.

Assess Your Learning on Thome (3)

1	b	2	b	3	С	4	b
5	С	6	2-3-1-4	-5		7	а
8	c	9	C	10	h	11	d

- 12 (1) Electrical energy
 - (2) Light energy.
 - (3) Thermal energy
- 13 1 Kinetic energy of moving water
 - Electrical energy (hydroelectric energy).
 - 3 Potential energy,
 - 4 Electrical energy (hydroelectric energy).

UNIT Four: Shifting Surfaces

Concept (4 f)

Self-Assessment 13

- (A) 1 canyon 2 fast 3 slow (B) Disappearance of a sandcastle (all items are
 - sandcastle (all items are examples of slow changes, while disappearance of a sandcastle is an example of fast changes).
- 2 (A) 1. (★) 2. (✔) 3. (✔)
 - (B) Because the sea waves hit the sandcastle
- 1. years slow 2. minutes – fast

Self-Assessmont

- (A) 1 erosion 2 Weathering
 - (B) The cracks becomes wider, then broken into small pieces.
- [2] (A) 1. (✓) 2. (✓) 3. (×)
 - (B) Because plant roots grow inside cracks of rocks that become wider, then broken into small pieces.

3

Mechanical weathering	Chemical weathering
Number (3)	Number (1) Number (2)
Number (4)	Number (5) Number (6)

Self-Assessment 15

- (A) 1. (×) 2. (√) 3. (×)
 - (B) Because another substance is formed as a result of chemical reactions
- (A) 1 chemical mechanical 2. water. 3. weathering
 - (B) Another substance is formed as a result of chemical reactions

3

Factors cause	Factors cause
mechanical	chemical
weathering	weathering
- wind - water - temperature - plant roots	– acids – water – oxygen gas

Sill Assertanced In

- (A) 1 erosion 2 gentle 3, delta
 - (B) Freezing of water inside rock cracks. (All items are caused by chemical weathering, while freezing of water inside rock cracks causes mechanical weathering.
- 2 (A) 1. (¥) 2. (√) 3. (¥)
 - (B) The broken weathered rocks are pulled down at the mountainsides.
- 3 1. (x) 2. (x) 3. (√)

Self-Assessment 47

- 🚹 (A) 1. sand dunes.
 - 2 Weathering
 - 3. deposition
 - (B) Because there is no eroded materials reach to another place to be laying down
- 2 (A) 1. (✓) 2. (✓) 3. (×)
 - (B) Neither erosion nor deposition occur, so no reshaping of the Earth's surface happened
- 3 1. (✓) 2. (≭) 3. (✓) 4 (≭)

Model Exam on Concept (4.1)

- (A) 1. Erosion process
 - 2 Limestone caves.
 - Deposition process
 - 4. Sand dune
 - (B) The rocks become weaker and easily to break down.
- 2 (A) 1.c 2.a 3.a 4.b
 - (B) Because it dissolves minerals that present in rocks which form new shapes.
- (A) 1. weathering
 - 2. chemical
 - 3. wind.
 - 4. mechanical
 - (B) 1. deposition.2. gentle

(Consumption 2)

Self-Assessment 18

- 1 (A) 1. b 2. d 3. c
 - (B) Due to the help of water in eroding the sides down
- 2 (A) 1. (X) 2. (X) 3. (√)
 - (B) The sides of the canyon could get deeper
- 3 1.A-B 2.B 3 A 4 B

- (A) 1. V-shape. 2 Sinai 3. type.
 - (B) Because if the path of the river is changed, it causes weathering and erosion of their houses
- (A) 1. (√) 2. (×) 3. (√)
 - (B) A small canyon may be formed
- 3 (A) 1. b 2. c 3. a

Self-Assessment- 20

- 1 (A) 1. b 2. c 3. a
 - (8) Because the fast flow of water can erode a lot of sediments and carry them away, that leads to the formation of canyons

- (A) 1 millions 2 erosion 3 triangular
 - (B) A canyon may be formed
- 3 1 Picture (A). 2. Picture (B). 3. weathering and erosion

Self-Assessment 2

- (A) 1. d 2. c 3. a
 - (B) Because they are partly responsible for slowing down the river water and help in trapping sediments.
- 2 (A) 1. deposition 2. valleys 3. Sand dunes
 - (B) The river drops the sediments it is carrying, forming deltas
- 3 No, because in the area (A) the speed of water is still fast and also area (A) is not a point of meeting the river with the ocean.

Self-Assessment - 22

- (A) 1. erosion 2 decreases 3 mcreases
 - (B) Because sand dunes are often formed when something blocks the path of sand as large rocks.

- 2 (A) 1. (≭) 2 (√) 3. (√)
 - (B) The sand travels for long distances
- 3 1 Weathering erosion
 - 2 Deposition
 - 3. Erosion deposition

Model Exam on Theme (4)

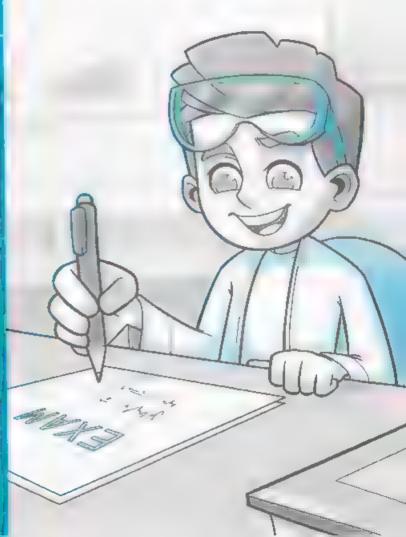
- 1 (A) 1. (\checkmark) 2. (\checkmark) 3. (\times) 4. (\checkmark)
 - (B) Because if the path of the river is changed, it causes erosion and deposition of their houses.
- 2 (A) 1. c 2. a 3. d 4. a
 - (B) The sedimentary rocks are formed
- 3 (A) 1. rivers 2. speed 3. deposition 4. canyon.
 - (8) 1. Weathering 2. Deposition 3. Frosion

Assess Your Learning on Theme (4)

1 a 2.d 3 b 4 c 5 a 6.a 7.c 8 a 9.b 10.a 11.c 12.c 13 1.b 2.c 3.a



Guide Answers of Final Examinations



Model Examinations

E-literature First Engineering the lets

Model Exam

- 1 (A) 1. a 2. c 3. d 4. a
 - (B) Minerals of rocks are dissolved causing their breaking down.
- 2 (A) 1. (×) 3. (×)
- 2. (×) 4. (✓)
- (B) 1. deposition
- 2. Valleys
- (A) 1. Electric bulb.
 - Renewable resources of energy
 - 3. Wind
 - 4. Electrical energy
 - (B) To conserve the electricity

Model Erany 2

- (A) 1. a 2. b 3. d 4. a
 - (B) Due to the reaction between iron and oxygen of air
- (A) 1 windmilis watermilis
 - 2. heat
 - 3. charcoal oil coal
 - 4. chemical kinetic
 - (B) A canyon is formed
- (A) 1. increases. 2. gentle
 - 4. deposition process.
 - (B) 1. (✓)
- 2 (x)

Model Exam. (3

- 1 (A) 1.a 2.a 3.d 4.d
 - (8) Because fossil fuel is formed over millions of years
- (A) 1. Mars. 2 renewable 3. electrical 4 batteries
 - (B) Electrical energy changes into kinetic energy
- 3 (A) 1. d 2. c 3. a 4. b
 - (B) 1. (2) (3) (4) 2. (3) – (4)

Mindel Exem (4

- 1 (A) 1. b 2. b 3. b 4 a
 - (B) Because they help in increasing the rate of deposition process.
- 2 (A) 1. Evaporation.
 - 2. Gasoline
 - 3. Fossil fuel
 - 4 Electric bulb
 - (B) We can recharge its batteries by connecting toy car to a nearby charger or replacing old batteries with new ones.
- 3 (A) 1. (√) 2. (√) 3. (x) 4. (x)
 - (B) 1. Solar thermal
 - 2. Kinetic Electrica:

Model Exam 1

- 1 (A) 1. c 2. c 3. b 4. c
 - (8) The car fuel indicator will go down
- 2 (A) 1. (×) 2. (√) 3. (√) 4. (√)
 - (B) Because water dissolves minerals in rocks, then this dissolved minerals combine again forming new shapes.
- (A) 1. warm. 2. changed 3 animals
 - 4 wind
 - (8) 1. (B), because it is affected by strong wind 2 (A)

Model Exam

- (A) 1. d 2. b 3. d 4. a
 (B) Oil and natural gas are formed
- (A) 1. water flow. 2. The Sun 3. solar 4. natural gas.
 - (B) Because it can be replaced shortly after it is used
- 3 (A) 1. (√) 2. (x) 3. (√) 4. (x)
 - (B) 1. Chemical Thermal Light 2. Chemical – Thermal –
 - Kinetic -- Electric -- Kinetic
 - -- sound

Worded States 7

- (A) 1, c 2. d 3, b 4, a
 - (B) The amount of produced electricity will decrease
- (A) 1. Concave mirrors.
 - 2. Liquid fuel
 - 3. Water turbine.
 - 4. Deposition process.
 - (B) Because solar panels absorb solar energy and convert it into electrical energy which calculators use to be operated.
- 3 (A) 1 Turbine 2 Generator 3. Coal. 4, Steam.
 - (B) 1. greenhouse. 2. radiant 3 thermal 4. warm

Model Exam.

- 1 (A) 1. d 2. b 3. c 4, a
 - (B) Because the potential energy stored in the spring changes into kinetic energy that moves the soap upward.
- 2 (A) 1. mechanical -- chemical
 - 2. water potential
 - 3. electrical imgation
 - 4. mechanical -- chemical

- (B) The electrical energy is converted into sound energy and light energy
- 3 (A) 1. Wind. 2. Coal.
 3. Walking or biking instead of driving a car
 4. Air pollution.

(B) Chemical Energy in converted energy stored figure Into in figure (2) (4) converted inlo Thermal Electrical energy that energy and converted kinetic energy is travelled into in figure through figure(1).....(3)..... converted Thermal energy that into is produced from the device in figure (5)

Model Exam 9

- (A) 1. c 2. a 3. a 4. a
 (B) It will not produce electrical energy.
- 2 (A) 1. (≭) 2. (√) 3 (≭) 4. (√)
 - (B) 1. Weathering process2. Erosion process.

- (A) 1. rocks. 2. mechanical 3. conservation of energy 4. renewable
 - (B) 1. Electrical energy.2. Thermal energy

Model Essim (II)

- (A) 1. c 2. b 3. d 4. c
 (B) Because it is used at a rate
 faster than it can be repewed.
- (A) 1. Water. 2. Watermill.
 3. Deposition.
 4. Chemical weathering
 - (B) You feel warm, because some electrical energy is converted into thermal energy
- 3. rocks.
 4. weathering (breaking down)
 - (B) 1. (2) 2. (1) – (3)

Final Examinations of Come Covernorsies

Cairo Governorate

1 Rod El Farag Edu. Zone

- 1 (A) 1. b 2. c 3. d 4. a
 - (B) Because wood produces thermal energy when it is burned
- 2 (A) 1 (V) 2 (V) 3 (X) 4 (X)
 - (B) Kinetic energy changes into sound energy
- (A) 1. d 2. c 3. b 4. a (B) 1. Water. 2. Coal

🔞 🛮 El Nocha Edu. Zom

- (A) 1. thermal energy
 - 2 Water
 - 3. weathering process.
 - 4. deposition
 - (B) Due to the reaction between iron and oxygen of air
- (A) 1 (√) 2 (*) 3 (*) 4 (√)
 - (B) The electrical energy is converted into sound energy and light energy
- 3 (A) 1. d 2. c 3. a 4. b
 - (B) 1. Light energy
 - 2. Electrical energy

J I Hallapolin Edu, Zone

- 1 (A) 1. a 2. b 3. d 4. c
 - (B) 1. The types of rocks exist in the landscape.
 - 2. The speed, age and size of river that form the valley
- 2 (A) 1 (X) 2. (X) 3 (√) 4 (X)
 - (B) 1. Kinetic 2. Electrical
- (A) 1. Kinetic energy.
 - 2. chemical weathering
 - 3. sound energy
 - 4. canyons.

(B)

	Mechanical weathering	Chemical weathering
Effect of water factor	over rocks and dissolves some substances in rocks then	When water d ssolves minerals in a rock, the dissolved minerals combine again forming new shapes as in limestone caves

4 El waily Edu. Zone

- 1 (A) 1 coal
- 2 hot
- 3 changed
- 4 wind
- (B) The Sun

- 2 (A) 1. c 2. a 3. a 4. b
 - (B) Wood. (All items belong to fossil fuel, while wood is considered as a biofuel).
- 3 (A) 1. (x) 2. (√) 3. (x) 4. (√)
 - (B) The electrical energy changes into light and thermal energies.

Giza Governorate

5 Dokki Edu. Zone

- 11 (A) 1. b 2. b 3. c 4. d
 - (B) The car movement decreases gradually until it stops.
- (A) 1. (★) 2. (√) 3. (√) 4. (★)
 (B) Sound energy.
- (A) 1. temperature
 - 2. kinetic
 - 3. weathering
 - 4. river
 - (B) Hand mixer. (All items depend on solar energy, while hand mixer depends on kinetic energy).

6 Agoza Edu, Zone

- (A) 1. d 2. a 3. a 4. c
 - (B) Electrical energy changes into sound, light and thermal energies.

- 2 (A) 1. (x) 2. (\sqrt) 3. (x) 4. (x)
 - (B) Wind. (All items belong to nonrenewable energy resources, while wind is considered as a renewable energy resource).
- 3 (A) 1. b 2. d 3. a 4. c (B) Mars.

Alexandria Governorate

7 Middle of Alex. Edu. Zone

- 1 (A) 1. (✓) 2. (✗) 3. (✗) 4. (✓)
 (B) A delta may be formed.
- (A) 1. sound 2. thermal 3. water 4. electricity.
 - (B) Hand mixer. (All items depend on solar energy, while hand mixer depends on kinetic energy).
- 3 (A) 1. c 2. a 3. d 4. a (B) weak.

Qalyoubia Governorate

8 Qalyoubia Edu. Zone

- 1 (A) 1. c 2. b 3. b 4. b
 - (B) Photosynthesis. (All items are processes that change the shape of Earth's surface, while photosynthesis does not change the shape of Earth's surface).

- (A) 1. (√) 2. (x) 3. (x) 4. (x) (B) Chemical weathering.
- 3 (A) 1. d 2 0 3 b

(B) Gasoline.

Menoufia Governorate

Monoutia Edu. Zone

- 1 (A) 1, c 2, c 3, d 4 c
 - (B) 1. Electrical energy.
 - 2. Light energy.
 - 3. Thermal energy.
- (A) 1. Fuel.
 - 2. Deposition process.
 - 3. Windmills or watermills.
 - 4. Delta.
 - (B) 1. Wind. 2. Temperature.
- 3 (A) 1. d 2. b 3. c
 - (B) Because fossil fuels are formed over millions of years, so they cannot be replaced as quickly as we use them.

Dakahlia Governorate

Science Inspectorate

- (A) 1. chemical 2. The Sun 4. Deposition Canvons
 - (B) It dissolves minerals found in these rocks, causing the break down of rocks.

- (A) 1. (√) 2. (x) 3. (√) 4. (x)
 - (B) Wind pushes the sand from a place to another, then friction occurs between sand and rocks causing their breaking down.
- (A) 1. The law of conservation of energy.
 - 2. Oxygen gas.

Device	Input energy	Output energy
1. Electric heater :	Electrical energy	Thermal
2. Hand beli :	Kinetic	Sound

(B) To control the water flow and increase the potential energy of water to generate electricity.

Ismailia Governorate

Science Inspectorate

- (A) 1. nonrenewable
 - 2. gravity.
 - electricity,
 - 4. wind
 - (B) Due to the reaction between iron and oxygen of air.
- (A) 1. d 2. c 4. b 3. c
 - (B) Valleys.

(A) 1, c 2, a 3, b (B) A canyon may be formed.

Suez Governorate

South Edu. Zone

- 1 (A) 1. b 2. d 3.4 (B) Due to the reaction between iron and oxygen of air.
- 2 (A) 1. (*) 2. (\(\sigma\) 3. (\(\sigma\) 4. (\(\sigma\) (B) Sand and soil.
- (A) 1, rocks.
 - 2. kinetic
 - 3. decreases
 - 4. thermal
 - (8) Sand dunes may be formed.

El-Behira Governorate

13 Kafr El-Dawar Edu. Zone

- (A) 1, b 2. a 3. d (B) Because fossil fuel is formed over millions of years.
- 2 (A) 1. (×) 2. (×) 3. (√) 4. (×) (B) It forms red-colored rust and

rocks become weak and break down easily.

- 3 (A) 1. Canyon
 - 2. heat.
 - 3. sound
 - 4. Weathering process

(B)

Device	Consumed (input) energy	Produced (output) energy
1. Halz dryer :	Electrical energy.	Sound, kinetic and thermal energies.
2. Fan :	Electrical energy.	Kinetic energy.

Minia Governorate

Bani Mazar Edu. Zone

1 (A) 1, c 2, c 3, a (B) You feel warm, because

some electrical energy is converted into thermal energy.

- 2 (A) 1. (*) 2. (*) 3. (1)
 - (B) 1. deposition 2. electrical
- (A) 1. Kinetic energy.
 - 2. Weathering process.
 - Windmill.
 - 4. Fuel.
 - (B) 1, electrical energy.
 - 2. thermal energy.

Qena Governorate

15 Science Inspectorate

- (A) 1. c 2. a 3. c 4. a
 - (B) Due to the reaction between iron and oxygen of air.
- 2 (A) 1. (*) 2. (\$\sqrt{}\$) 3. (\$\sqrt{}\$) 4. (*)
 - (B) The electrical energy changes into light and thermal energies.
- (A) 1. Chemical
 - 2. natural gas.
 - 3. sand dunes.
 - 4. deposition
 - (B) Blender.